Colour Television

Chassis

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Service Manual

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1. Revision List

Manual xxxx xxx xxxx.0

- First release.

2. Technical Specifications, Diversity, and Connections

Index of this chapter:

2.1 Technical Specifications
2.2 Directions for Use
2.3 Connections
2.4 Chassis Overview

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

2.1 Technical Specifications

For on-line product support please use the CTN links in Table 2-1. Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

Table 2-1 Described Model Numbers and Diversity

CTN	Styling styling sh.	SSB 3104 313	2 Conn	4 Mechanics Wire	Assembly Removal	LCD Removal	7 Descriptions PSU	Tuner	AmbiLight	TCON	9 Wng Diagram	10 Schematics Common LiteOn	Additional LiteOn	Common Everlight	Additional Everlight	B01 (Tuner)	B02 (PNX85500)	B03 (DC/DC / Class D)	B04 (I/O)	B05 (DDR)	B06 (non-DVBS-LVDS)	B07 (DVBS-FE)	B08 (DVBS-Supp.)	B09 (non-DVBS-conn.)	B11 (TCON-LGD)	B13 (Ambilight)	B14 (TCON-SHP)
42PFL8605D/93	Matisse 11-1	63643 10-16	2.3	4-1	4.3	t.b.d.	7.2	7.4.1	-	-	9-1	10-1	10-2	10-5	10-6	10-9	10-10	10-11	10-12	10-13	10-14	-	-	10-15	-	-	-
42PFL8605/98	Matisse 11-1	63643 10-16	2.3	4-1	4.3	t.b.d.	7.2	7.4.1	-	-	9-1	10-1	10-2	10-5	10-6	10-9	10-10	10-11	10-12	10-13	10-14	-	-	10-15	-	-	-
46PFL8605D/93	Matisse 11-1	63643 10-16	2.3	4-2	4.3	t.b.d.	7.2	7.4.1	-	-	9-1	10-1	10-3	10-5	10-7	10-9	10-10	10-11	10-12	10-13	10-14	-	-	10-15	-	-	-

2.2 Directions for Use

You can download this information from the following websites:
http://www.philips.com/support
http://www.p4c.philips.com

2.3 Connections

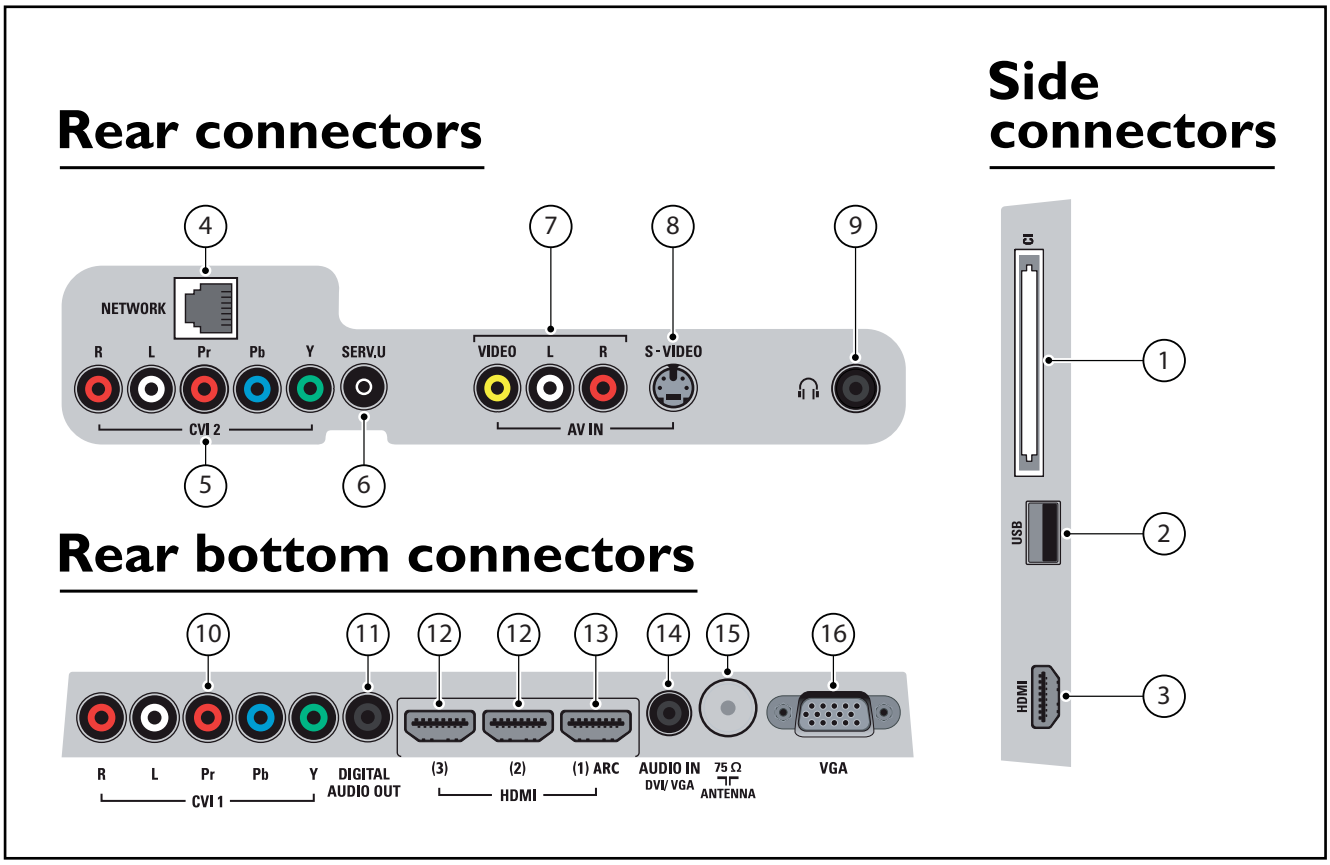

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Figure 2-1 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.3.1 Side Connections

1 - Common Interface

68p - See diagram B01F HDMI & CI

2 - USB2.0

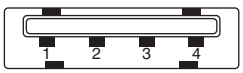

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Figure 2-2 USB (type A)

1	- +5V		
2	- Data (-)		
3	- Data (+)		
4	- Ground	Gnd	

3 - HDMI: Digital Video, Digital Audio - In

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Figure 2-3 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- n.c.		
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

2.3.2 Rear Connections

4 - RJ45: Ethernet (optional)

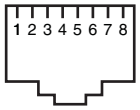

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Figure 2-4 Ethernet connector

1	- TD+	Transmit signal
2	- TD-	Transmit signal
3	- RD+	Receive signal
4	- CT	Centre Tap: DC level fixation

5	- CT	Centre Tap: DC level fixation	
6	- RD-	Receive signal	
7	- GND	Gnd	
8	- GND	Gnd	

5 - CVI 2: Cinch: Video YPbPr - In, Audio - In

Gn	- Video Y	1 V_{PP} / 75 ohm	
Bu	- Video Pb	0.7 V_{PP} / 75 ohm	
Rd	- Video Pr	0.7 V_{PP} / 75 ohm	
Rd	- Audio - R	0.5 V_{RMS} / 10 kohm	
Wh	- Audio - L	0.5 V_{RMS} / 10 kohm	

6 - Service Connector (UART)

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

7 - Cinch: Video CVBS - In, Audio - In

Ye	- Video CVBS	1 V_{PP} / 75 ohm	
Wh	- Audio L	0.5 V_{RMS} / 10 kohm	
Rd	- Audio R	0.5 V_{RMS} / 10 kohm	

8 - S-Video (Hosiden): Video Y/C - In

1	- Ground Y	Gnd	
2	- Ground C	Gnd	
3	- Video Y	1 V_{PP} / 75 ohm	
4	- Video C	0.3 V_{PP}P / 75 ohm	

9 - Head phone (Output)

Bk	- Head phone	32 - 600 ohm / 10 mW	

2.3.3 Rear Connections - Bottom

10 - CVI 1: Video RGB - In, CVBS - In/Out, Audio - In/Out

See 5 - CVI 2: Cinch: Video YPbPr - In, Audio - In

11 - Cinch: S/PDIF - Out

Bk	- Coaxial	0.4 - 0.6V_{PP} / 75 ohm	

12 - HDMI 2 (& 3 optional): Digital Video, Digital Audio - In

See 3 - HDMI: Digital Video, Digital Audio - In

13 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/ Out

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Figure 2-5 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- ARC	Audio Return Channel	
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

14 - Cinch: Audio - In (VGA/DVI)

Rd	- Audio R	0.5 V_{RMS} / 10 kohm	
Wh	- Audio L	0.5 V_{RMS} / 10 kohm	

15 - Aerial - In

-	- IEC-type (EU)	Coax, 75 ohm	

16 - VGA: Video RGB - In

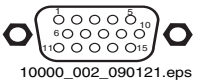

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Figure 2-6 VGA Connector

1	- Video Red	0.7 V_{PP} / 75 ohm	
2	- Video Green	0.7 V_{PP} / 75 ohm	
3	- Video Blue	0.7 V_{PP} / 75 ohm	
4	- n.c.		
5	- Ground	Gnd	
6	- Ground Red	Gnd	
7	- Ground Green	Gnd	
8	- Ground Blue	Gnd	
9	- +5V_{DC}	+5 V	
10	- Ground Sync	Gnd	
11	- n.c.		
12	- DDC_SDA	DDC data	
13	- H-sync	0 - 5 V	
14	- V-sync	0 - 5 V	
15	- DDC_SCL	DDC clock	

2.4 Chassis Overview

Refer to chapter Block Diagrams for PWB/CBA locations.

3. Precautions, Notes, and Abbreviation List

Index of this chapter:

3.1 Safety Instructions
3.2 Warnings
3.3 Notes
3.4 Abbreviation List

3.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard. Of de set ontploft!

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
  1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
  2. Set the Mains/AC Power switch to the “on” position (keep the Mains/AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
  4. Switch “off” the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

3.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched “on”.
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

3.3 Notes

3.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⊓) and without (⊼) aerial signal. Measure the voltages in the power supply section both in normal operation (⏻) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.

3.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kΩ).
- Resistor values with no multiplier may be indicated with either an “E” or an “R” (e.g. 220E or 220R indicates 220 Ω).
- All capacitor values are given in micro-farads ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An “asterisk” (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed on the Philips Spare Parts Web Portal.

3.3.3 Spare Parts

For the latest spare part overview, consult your Philips Spare Part web portal.

3.3.4 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: http://www.atyourservice-magazine.com. Select “Magazine”, then go to “Repair downloads”. Here you will find Information on how to deal with BGA-ICs.

BGA Temperature Profiles

For BGA-ICs, you **must** use the correct temperature-profile. Where applicable and available, this profile is added to the IC Data Sheet information section in this manual.

3.3.5 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilize the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch “off” unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

3.3.6 Alternative BOM identification

It should be noted that on the European Service website, "Alternative BOM" is referred to as "Design variant".

The **third digit** in the serial number (example: AG**2**B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.
By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number "1" (example: AG**1**B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: AG**2**B0335000001), then the set has been produced according to B.O.M. no. 2. This is important for ordering the correct spare parts!
For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26= 35 different B.O.M.s can be indicated by the third digit of the serial number.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production centre (e.g. AG is Bruges), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2006 week 17). The 6 last digits contain the serial number.

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Figure 3-1 Serial number (example)

3.3.7 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.
If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

3.3.8 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages**. While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3.4 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
AVC	Audio Video Controller
AVIP	Audio Video Input Processor
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BDS	Business Display Solutions (iTV)
BLR	Board-Level Repair
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
B-TXT	Blue TeleteXT
C	Centre channel (audio)
CEC	Consumer Electronics Control bus: remote control bus on HDMI connections
CL	Constant Level: audio output to connect with an external amplifier
CLR	Component Level Repair
ComPair	Computer aided rePair
CP	Connected Planet / Copy Protection
CSM	Customer Service Mode
CTI	Color Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DCM	Data Communication Module. Also referred to as System Card or Smartcard (for iTV).
DDC	See "E-DDC"
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFI	Dynamic Frame Insertion

DFU	Directions For Use: owner's manual
DMR	Digital Media Reader: card reader
DMSD	Digital Multi Standard Decoding
DNM	Digital Natural Motion
DNR	Digital Noise Reduction: noise reduction feature of the set
DRAM	Dynamic RAM
DRM	Digital Rights Management
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for service technicians
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394
DVB-C	Digital Video Broadcast - Cable
DVB-T	Digital Video Broadcast - Terrestrial
DVD	Digital Versatile Disc
DVI(-d)	Digital Visual Interface (d= digital only)
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information form the display.
EDID	Extended Display Identification Data (VESA standard)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMI	Electro Magnetic Interference
EPG	Electronic Program Guide
EPLD	Erasable Programmable Logic Device
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FDS	Full Dual Screen (same as FDW)
FDW	Full Dual Window (same as FDS)
FLASH	FLASH memory
FM	Field Memory or Frequency Modulation
FPGA	Field-Programmable Gate Array
FTV	Flat TeleVision
Gb/s	Giga bits per second
G-TXT	Green TeleteXT
H	H_sync to the module
HD	High Definition
HDD	Hard Disk Drive
HDCP	High-bandwidth Digital Content Protection: A “key” encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a “snow vision” mode or changed to a low resolution. For normal content distribution the source and the display device must be enabled for HDCP “software key” decoding.
HDMI	High Definition Multimedia Interface
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I^2C	Inter IC bus
I^2D	Inter IC Data bus
I^2S	Inter IC Sound bus
IF	Intermediate Frequency
IR	Infra Red
IRQ	Interrupt Request
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a. SDI), is a digitized video format used for broadcast grade video. Uncompressed digital component or digital composite signals can be used. The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.
ITV	Institutional TeleVision; TV sets for hotels, hospitals etc.
LS	Last Status; The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
LATAM	Latin America
LCD	Liquid Crystal Display
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LPL	LG.Philips LCD (supplier)
LS	Loudspeaker
LVDS	Low Voltage Differential Signalling
Mbps	Mega bits per second
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MHEG	Part of a set of international standards related to the presentation of multimedia information, standardised by the Multimedia and Hypermedia Experts Group. It is commonly used as a language to describe interactive television services
MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
MOP	Matrix Output Processor
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
MPEG	Motion Pictures Experts Group
MPIF	Multi Platform InterFace
MUTE	MUTE Line
MTV	Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
NTC	Negative Temperature Coefficient, non-linear resistor
NTSC	National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non-Volatile Memory: IC containing TV related data such as alignments
O/C	Open Circuit
OSD	On Screen Display
OAD	Over the Air Download. Method of software upgrade via RF transmission. Upgrade software is broadcasted in TS with TV channels.
OTC	On screen display Teletext and Control; also called Artistic (SAA5800)
P50	Project 50: communication protocol between TV and peripherals
PAL	Phase Alternating Line. Color system mainly used in West Europe (color carrier= 4.433619 MHz) and South America (color carrier PAL M=

	3.575612 MHz and PAL N= 3.582056 MHz)
PCB	Printed Circuit Board (same as “PWB”)
PCM	Pulse Code Modulation
PDP	Plasma Display Panel
PFC	Power Factor Corrector (or Pre-conditioner)
PIP	Picture In Picture
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)
POR	Power On Reset, signal to reset the uP
PSDL	Power Supply for Direct view LED backlight with 2D-dimming
PSL	Power Supply with integrated LED drivers
PSLS	Power Supply with integrated LED drivers with added Scanning functionality
PTC	Positive Temperature Coefficient, non-linear resistor
PWB	Printed Wiring Board (same as “PCB”)
PWM	Pulse Width Modulation
QRC	Quasi Resonant Converter
QTNR	Quality Temporal Noise Reduction
QVCP	Quality Video Composition Processor
RAM	Random Access Memory
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.
RC	Remote Control
RC5 / RC6	Signal protocol from the remote control receiver
RESET	RESET signal
ROM	Read Only Memory
RSDS	Reduced Swing Differential Signalling data interface
R-TXT	Red TeleteXT
SAM	Service Alignment Mode
S/C	Short Circuit
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs
SCL	Serial Clock I^2C
SCL-F	CLock Signal on Fast I^2C bus
SD	Standard Definition
SDA	Serial Data I^2C
SDA-F	DAta Signal on Fast I^2C bus
SDI	Serial Digital Interface, see “ITU-656”
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Mémoire. Color system mainly used in France and East Europe. Color carriers= 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switched Mode Power Supply
SoC	System on Chip
SOG	Sync On Green
SOPS	Self Oscillating Power Supply
SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
SRP	Service Reference Protocol
SSB	Small Signal Board
SSC	Spread Spectrum Clocking, used to reduce the effects of EMI
STB	Set Top Box
STBY	STand-BY
SVGA	800 × 600 (4:3)
SVHS	Super Video Home System
SW	Software
SWAN	Spatial temporal Weighted Averaging Noise reduction
SXGA	1280 × 1024
TFT	Thin Film Transistor
THD	Total Harmonic Distortion
TMDS	Transmission Minimized Differential Signalling
TS	Transport Stream
TXT	TeleteXT
TXT-DW	Dual Window with TeleteXT
UI	User Interface
uP	Microprocessor
UXGA	1600 × 1200 (4:3)
V	V-sync to the module
VESA	Video Electronics Standards Association
VGA	640 × 480 (4:3)
VL	Variable Level out: processed audio output toward external amplifier
VSB	Vestigial Side Band; modulation method
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
WXGA	1280 × 768 (15:9)
XTAL	Quartz crystal
XGA	1024 × 768 (4:3)
Y	Luminance signal
Y/C	Luminance (Y) and Chrominance (C) signal
YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
YUV	Component video

4. Mechanical Instructions

Index of this chapter:

4.1 Cable Dressing Matisse styling
4.2 Service Positions
4.3 Assy/Panel Removal Matisse Styling
4.4 Set Re-assembly

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Cable Dressing Matisse styling

Note: pictures are taken from the European equivalent (with SCART connector).

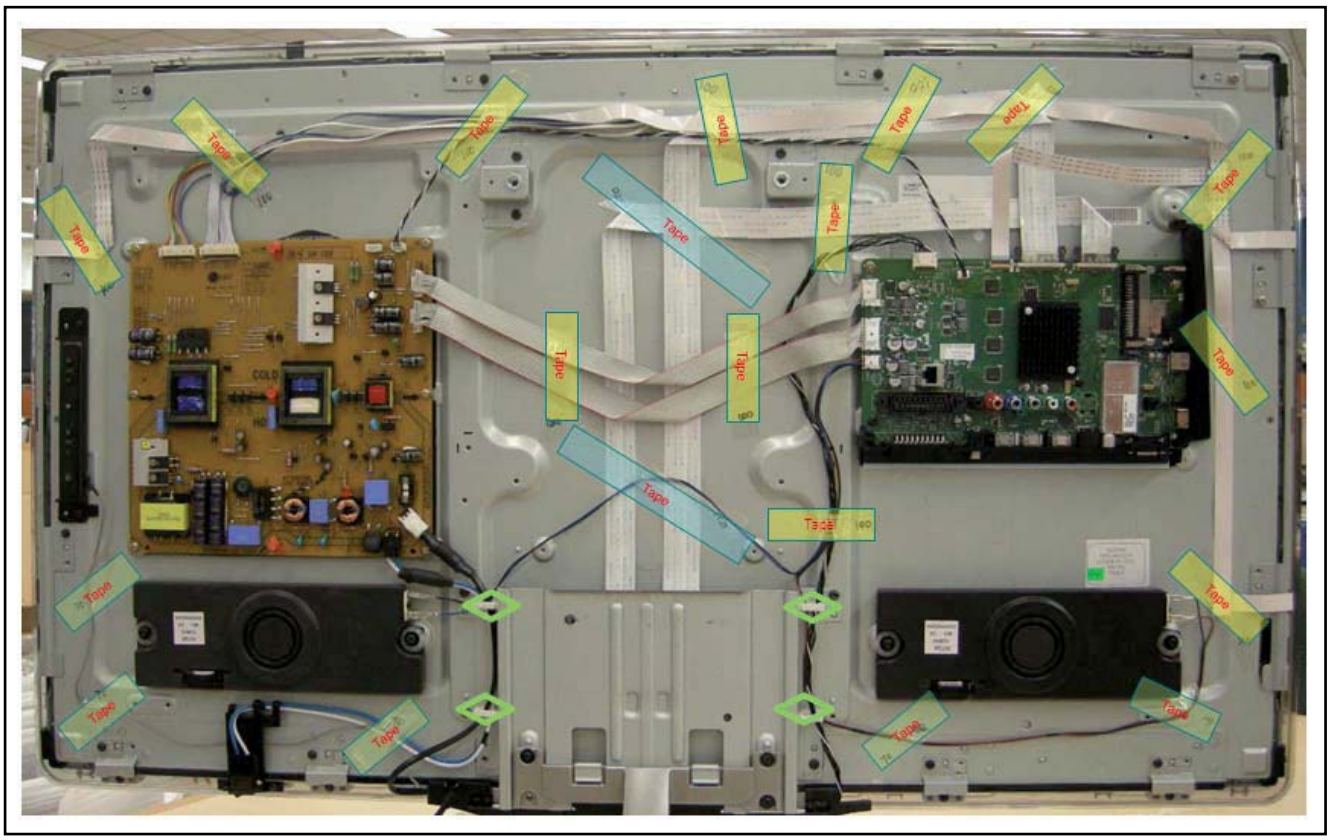

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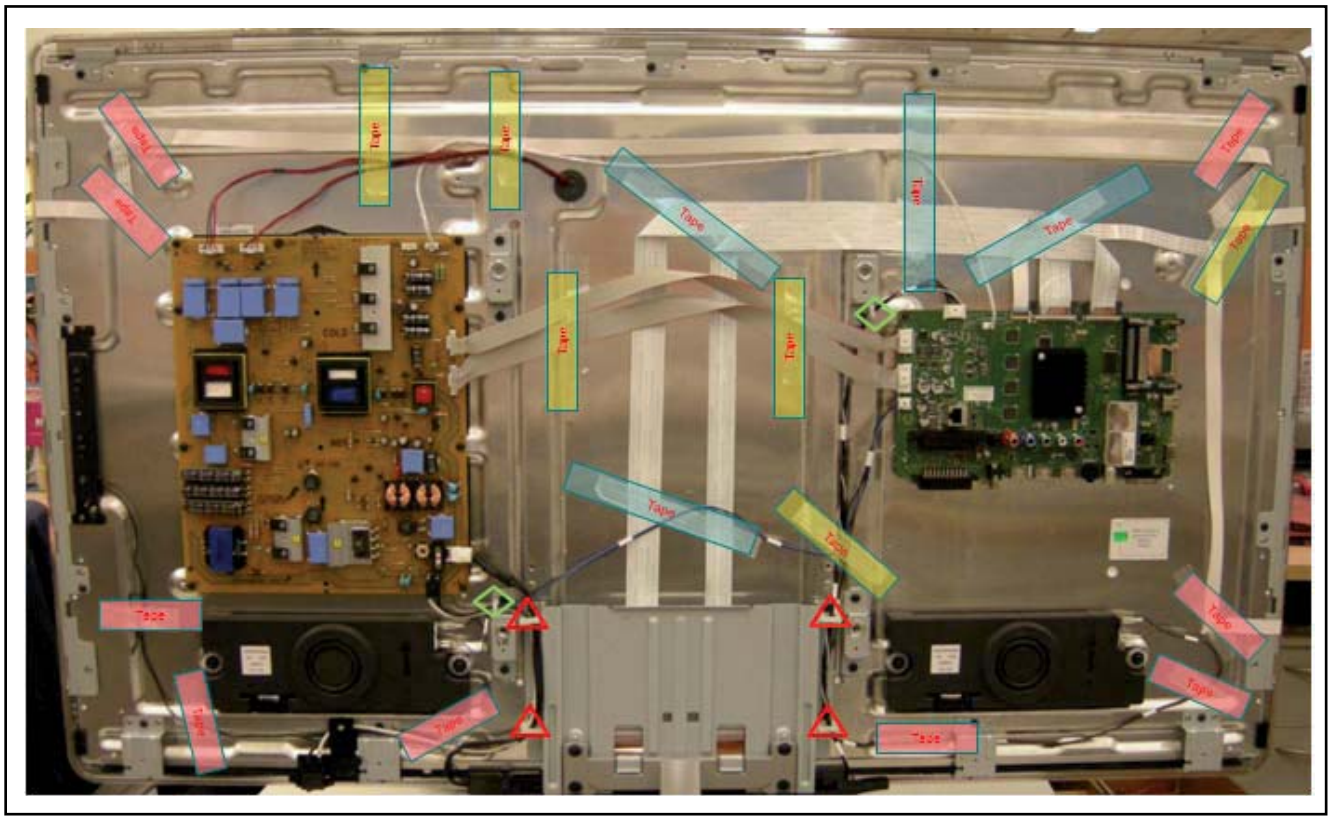
Figure 4-1 Cable dressing 42" 8000-series



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100401

Figure 4-2 Cable dressing 46" 8000-series

4.2 Service Positions

For easy servicing of a TV set, the set should be put face down on a soft flat surface, foam buffers or other specific workshop tools. Ensure that a stable situation is created to perform measurements and alignments. When using foam bars take care that these always support the cabinet and **never** only the display. **Caution:** Failure to follow these guidelines can seriously damage the display!
Ensure that ESD safe measures are taken.

4.3 Assy/Panel Removal Matisse Styling

No detailed information is available at time of publishing.

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position.
- Pay special attention not to damage the EMC foams in the set. Ensure that EMC foams are mounted correctly.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

5.1 Test Points
5.2 Service Modes
5.3 Stepwise Start-up
5.4 Service Tools
5.5 Error Codes
5.6 The Blinking LED Procedure
5.7 Protections
5.8 Fault Finding and Repair Tips
5.9 Software Upgrading

5.1 Test Points

As most signals are digital, it will be difficult to measure waveforms with a standard oscilloscope. However, several key ICs are capable of generating test patterns, which can be controlled via ComPair. In this way it is possible to determine which part is defective.

Perform measurements under the following conditions:
- Service Default Mode.
- Video: Colour bar signal.
- Audio: 3 kHz left, 1 kHz right.

5.2 Service Modes

Service Default mode (SDM) and Service Alignment Mode (SAM) offers several features for the Service technician, while the Customer Service Mode (CSM) is used for communication between the call centre and the customer.

This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the abilities of structured troubleshooting, error code reading, and software version read-out for all chassis. (see also section "5.4.1 ComPair").

Note: For the new model range, a new remote control (RC) is used with some renamed buttons. This has an impact on the activation of the Service modes. For instance the old "MENU" button is now called "HOME" (or is indicated by a "house" icon).

5.2.1 Service Default Mode (SDM)

Purpose
- To create a pre-defined setting, to get the same measurement results as given in this manual.
- To override SW protections detected by stand-by processor and make the TV start up to the step just before protection (a sort of automatic stepwise start-up). See section "5.3 Stepwise Start-up".
- To start the blinking LED procedure where only LAYER 2 errors are displayed. (see also section "5.5 Error Codes").

Specifications

Table 5-1 SDM default settings

Region	Freq. (MHz)	Default system
Europe, AP(PAL/Multi)	475.25	PAL B/G
Europe, AP DVB-T	546.00 PID Video: 0B 06 PID PCR: 0B 06 PID Audio: 0B 07	DVB-T

- All picture settings at 50% (brightness, colour, contrast).
- Sound volume at 25%.
- All service-unfriendly modes (if present) are disabled, like:
  - (Sleep) timer.
  - Child/parental lock.
  - Picture mute (blue mute or black mute).
  - Automatic volume levelling (AVL).
  - Skip/blank of non-favourite pre-sets.

How to Activate SDM

For this chassis there are two kinds of SDM: an **analogue SDM** and a **digital SDM**. Tuning will happen according Table 5-1.
- **Analogue SDM**: use the standard RC-transmitter and key in the code "062596", directly followed by the "MENU" (or HOME) button.
  Note: It is possible that, together with the SDM, the main menu will appear. To switch it "off", push the "MENU"(or HOME) button again.
- **Digital SDM**: use the standard RC-transmitter and key in the code "062593", directly followed by the "MENU" (or HOME) button.
  Note: It is possible that, together with the SDM, the main menu will appear. To switch it "off", push the "MENU" (or HOME) button again.
- **Analogue SDM** can also be activated by grounding for a moment the solder path on the SSB, with the indication "SDM" (see figure Service mode pad).

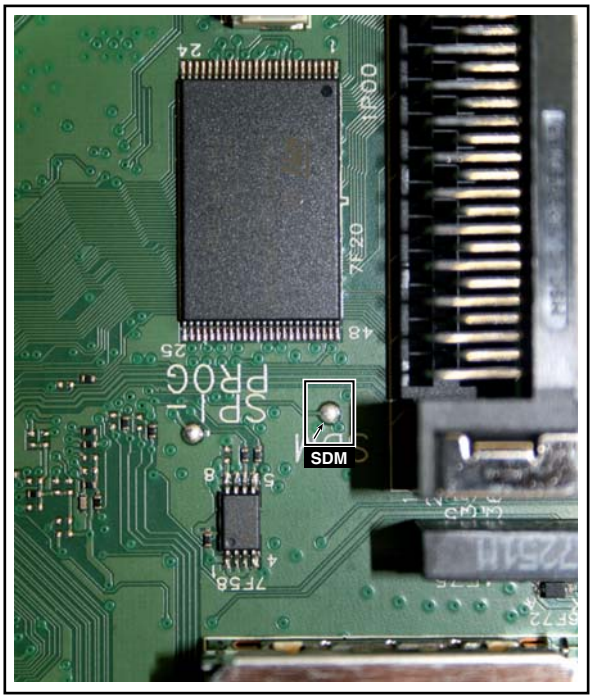

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Figure 5-1 Service mode pad

After activating this mode, "SDM" will appear in the upper right corner of the screen (when a picture is available).

How to Navigate

When the "MENU" (or HOME) button is pressed on the RC transmitter, the TV set will toggle between the SDM and the normal user menu.

How to Exit SDM

Use one of the following methods:
- Switch the set to STAND-BY via the RC-transmitter.
- Via a standard customer RC-transmitter: key in "00"-sequence.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To perform (software) alignments.
- To change option settings.
- To easily identify the used software version.
- To view operation hours.
- To display (or clear) the error code buffer.

How to Activate SAM

Via a standard RC transmitter: Key in the code “062596” directly followed by the “INFO”/”HOME” button. After activating SAM with this method a service warning will appear on the screen, continue by pressing the “OK” button on the RC.

Contents of SAM (see also Table 6-8)

- **Hardware Info.**
  - **A. SW Version.** Displays the software version of the main software (**example:** Q555X-1.2.3.4 = AAAAB_X.Y.W.Z).
    - **AAAA**= the chassis name.
    - **B**= the SW branch version. This is a sequential number (this is no longer the region indication, as the software is now multi-region).
    - **X.Y.W.Z**= the software version, where X is the main version number (different numbers are not compatible with one another) and Y.W.Z is the sub version number (a higher number is always compatible with a lower number).
  - **B. STBY PROC Version.** Displays the software version of the stand-by processor.
  - **C. Production Code**. Displays the production code of the TV, this is the serial number as printed on the back of the TV set. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM. ComPair will foresee in a possibility to do this.
- **Operation Hours.** Displays the accumulated total of operation hours (not the stand-by hours). Every time the TV is switched “on/off”, 0.5 hours is added to this number.
- **Errors** (followed by maximum 10 errors). The most recent error is displayed at the upper left (for an error explanation see section “5.5 Error Codes”).
- **Reset Error Buffer.** When “cursor right” (or the “OK button) is pressed and then the “OK” button is pressed, the error buffer is reset.
- **Alignments.** This will activate the “ALIGNMENTS” sub-menu. See Chapter 6. Alignments.
- **Dealer Options.** Extra features for the dealers.
- **Options.** Extra features for Service. For more info regarding option codes, 6. Alignments.
  Note that if the option code numbers are changed, these have to be confirmed with pressing the “OK” button before the options are stored. Otherwise changes will be lost.
- **Initialize NVM.** The moment the processor recognizes a corrupted NVM, the “initialize NVM” line will be highlighted. Now, two things can be done (dependent of the service instructions at that moment):
  - Save the content of the NVM via ComPair for development analysis, **before** initializing. This will give the Service department an extra possibility for diagnosis (e.g. when Development asks for this).
  - Initialize the NVM.

Note: When the NVM is corrupted, or replaced, there is a high possibility that no picture appears because the display code is not correct. So, before initializing the NVM via the SAM, a picture is necessary and therefore the correct display option has to be entered. Refer to Chapter 6. Alignments for details. To adapt this option, it’s advised to use ComPair (the correct values for the options can be found in Chapter 6. Alignments) or a method via a standard RC (described below).
Changing the display option via a standard RC: Key in the code “062598” directly followed by the “MENU” (or HOME) button and “XXX” (where XXX is the 3 digit decimal display code as mentioned in Table 6-7). Make sure to key in all three digits, also the leading zero’s. If the above action is successful, the front LED will go out as an indication that the RC sequence was correct. After the display option is changed in the NVM, the TV will go to the Stand-by mode. If the NVM was corrupted or empty before this action, it will be initialized first (loaded with default values). This initializing can take up to 20 seconds.

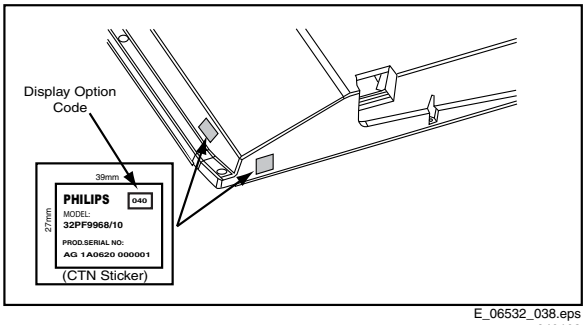

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Figure 5-2 Location of Display Option Code sticker

- **Store - go right.** All options and alignments are stored when pressing “cursor right” (or the “OK” button) and then the “OK”-button.
- **SW Maintenance.**
  - **SW Events.** Not useful for Service purposes. In case of specific software problems, the development department can ask for this info.
  - **HW Events.** Not useful for Service purposes. In case of specific software problems, the development department can ask for this info.
- **Test settings.** For development purposes only.
- **Development file versions.** Not useful for Service purposes, this information is only used by the development department.
- **Upload to USB.** To upload several settings from the TV to an USB stick, which is connected to the SSB. The items are “Channel list”, “Personal settings”, “Option codes”, “Display-related alignments”, “Identification data” and “History list”. **First a directory “repair\” has to be created in the root of the USB stick.** To upload the settings select each item separately, press “cursor right” (or the “OK” button), confirm with “OK” and wait until “Done” appears. In case the download to the USB stick was not successful “Failure” will appear. In this case, check if the USB stick is connected properly and if the directory “repair” is present in the root of the USB stick. Now the settings are stored onto the USB stick and can be used to download onto another TV or other SSB. Uploading is of course only possible if the software is running and if a picture is available. This method is created to be able to save the customer’s TV settings and to store them into another SSB.
- **Download to USB.** To download several settings from the USB stick to the TV, same way of working needs to be followed as with uploading. To make sure that the download of the channel list from USB to the TV is executed properly, it is necessary to restart the TV and tune to a valid preset if necessary.
- **NVM editor.** For NET TV the set type must be installed.

Also the production code can be entered via the RC-transmitter.

How to Navigate

- In SAM, the menu items can be selected with the “CURSOR UP/DOWN” key on the RC-transmitter. The selected item will be highlighted. When not all menu items fit on the screen, move the “CURSOR UP/DOWN” key to display the next/previous menu items.
- With the “CURSOR LEFT/RIGHT” keys, it is possible to:
  - (De) activate the selected menu item.
  - (De) activate the selected sub menu.

- With the “OK” key, it is possible to activate the selected action.

How to Exit SAM

Use one of the following methods:

- Switch the TV set to STAND-BY via the RC-transmitter.
- Via a standard RC-transmitter, key in “00” sequence, or select the “BACK” key.

5.2.3 Customer Service Mode (CSM)

Purpose

When a customer is having problems with his TV-set, he can call his dealer or the Customer Helpdesk. The Service technician can then ask the customer to activate the CSM, in order to identify the status of the set. Now, the Service technician can judge the severity of the complaint. In many cases, he can advise the customer how to solve the problem, or he can decide if it is necessary to visit the customer.
The CSM is a read only mode; therefore, modifications in this mode are not possible.

When in this chassis CSM is activated, a testpattern will be displayed during 5 seconds (1 second Blue, 1 second Green and 1 second Red, then again 1 second Blue and 1 second Green). This test pattern is generated by the PNX51X0. So if this test pattern is shown, it could be determined that the back end video chain (PNX51X0, LVDS, and display) of the SSB is working. For TV sets without the PNX51X0 inside, every menu from CSM will be used as check for the back end video chain.

When CSM is activated and there is a USB stick connected to the TV set, the software will dump the complete CSM content to the USB stick. The file (Csm.txt) will be saved in the root of the USB stick. This info can be handy if no information is displayed. To have fast feedback from the field, a flashdump can be requested. While in CSM, push the red button + dial serial digits ‘2679’ (same keys to form the word ‘COPY’ with a cellphone). A file Dump_settype_serienumber.bin will be written on the connected USB device. This can take 1/2 minute, depending on the quantity of data that needs to be dumped.

Also when CSM is activated, the LAYER 1 error is displayed via blinking LED. Only the latest error is displayed. (see also section 5.5 Error Codes).

How to Activate CSM

Key in the code “123654” via the standard RC transmitter.
Note: Activation of the CSM is only possible if there is no (user) menu on the screen!

How to Navigate

By means of the “CURSOR-DOWN/UP” knob on the RC-transmitter, can be navigated through the menus.

Contents of CSM

The contents are reduced to 3 pages: General, Software versions and Quality items. The group names itself are not shown anywhere in the CSM menu.

General

- **Set Type.** This information is very helpful for a helpdesk/ workshop as reference for further diagnosis. In this way, it is not necessary for the customer to look at the rear of the TV-set. Note that if an NVM is replaced or is initialized after corruption, this set type has to be re-written to NVM. This can be done in SAM via the NVM editor, or via ComPair.
- **Production Code.** Displays the production code (the serial number) of the TV. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM. This can be done in SAM via the NVM editor, or via ComPair.
- **Installed date.** Indicates the date of the first installation of the TV. This date is acquired via time extraction.
- **Options 1.** Gives the option codes of option group 1 as set in SAM (Service Alignment Mode).
- **Options 2.** Gives the option codes of option group 2 as set in SAM (Service Alignment Mode).
- **12NC SSB.** Gives an identification of the SSB as stored in NVM. Note that if an NVM is replaced or is initialized after corruption, this identification number has to be re-written to NVM. ComPair will foresee in a possibility to do this. This identification number is the 12nc number of the SSB.
- **12NC display.** Shows the 12NC of the display.
- **12NC supply.** Shows the 12NC of the supply.
- **12NC 200Hz board.** Shows the 12NC of the 200Hz Panel.

Software versions

- **Current main SW.** Displays the build-in main software version. In case of field problems related to software, software can be upgraded. As this software is consumer upgradeable, it will also be published on the Internet.
  Example: Q555X_1.2.3.4
- **Standby SW.** Displays the build-in stand-by processor software version. Upgrading this software will be possible via ComPair or via USB (see section 5.9 Software Upgrading).
  Example: STDBY_88.68.1.2.
- **e-UM version.** Displays the electronic user manual SW-version.

Quality items

- **Signal quality.** bad / average /good
- **Ethernet MAC address.** Dispays the MAC address present in the SSB.
- **Wireless MAC address.** Displays the wireless MAC address to support the Wi-Fi functionality.
- **BDS key.** Indicates if the set is in the BDS status.
- **CI slot present.** If the common interface module is detected.
- **Event counter**.

How to Exit CSM

Press “MENU” (or HOME) / “Back” key on the RC-transmitter.

5.3 Stepwise Start-up

When the TV is in a protection state due to an error detected by stand-by software (error blinking is displayed) **and** SDM is activated via shortcutting the SDM solder path on the SSB, the TV starts up until it reaches the situation just before protection. So, this is a kind of automatic stepwise start-up. In combination with the start-up diagrams below, you can see which supplies are present at a certain moment. Caution: in case the start-up in this mode with a faulty FET 7U0X is done, you can destroy all IC's supplied by the +1V8 and +1v1, due to overvoltage (12V on XVX-line). It is recommended to measure first the FET 7U0X or others FET's on shortcircuit before activating SDM via the service pads.

The abbreviations "SP" and "MP" in the figures stand for:

- SP: protection or error detected by the **S**tand-by **P**rocessor.
- MP: protection or error detected by the MIPS **M**ain **P**rocessor.

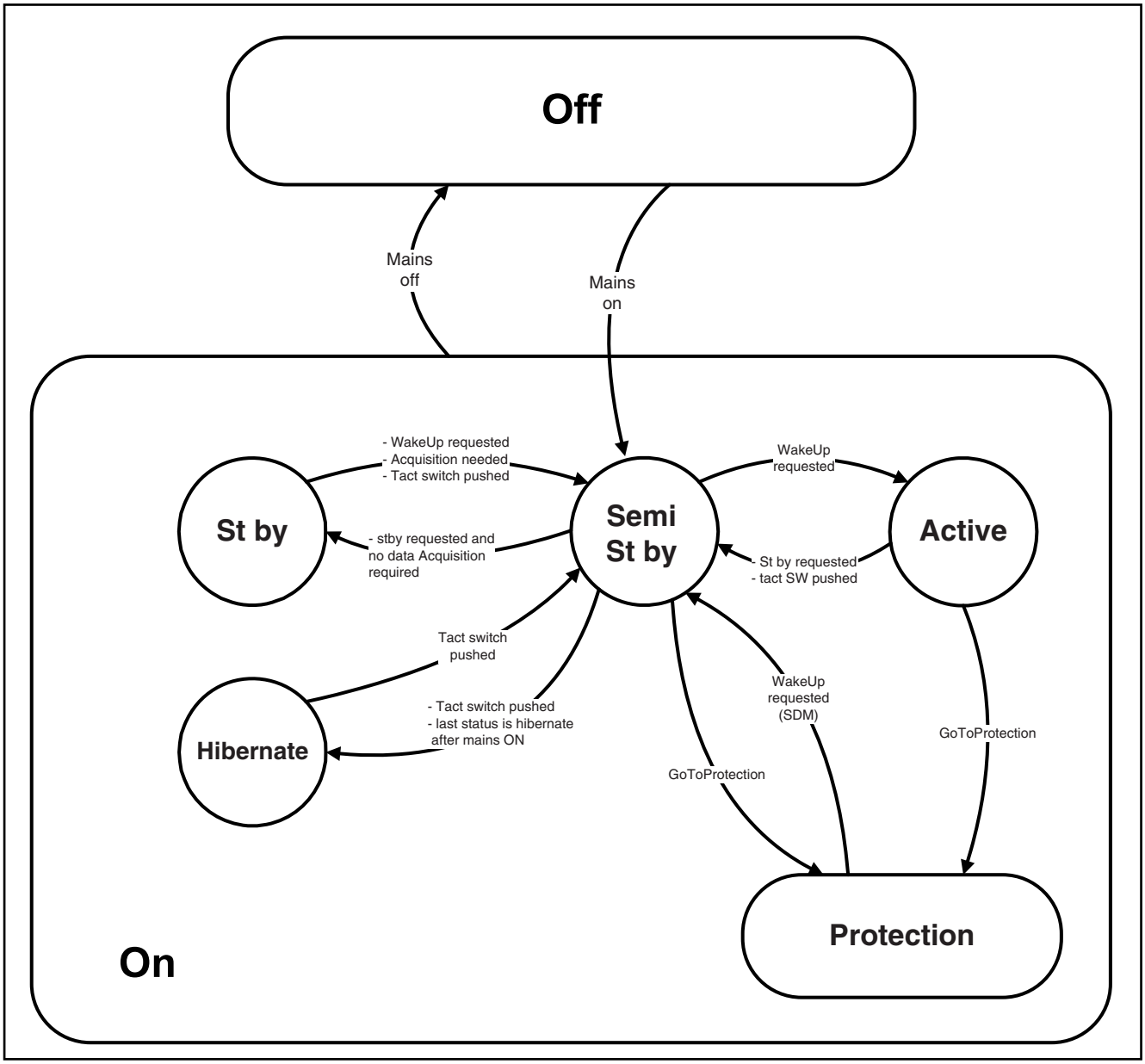

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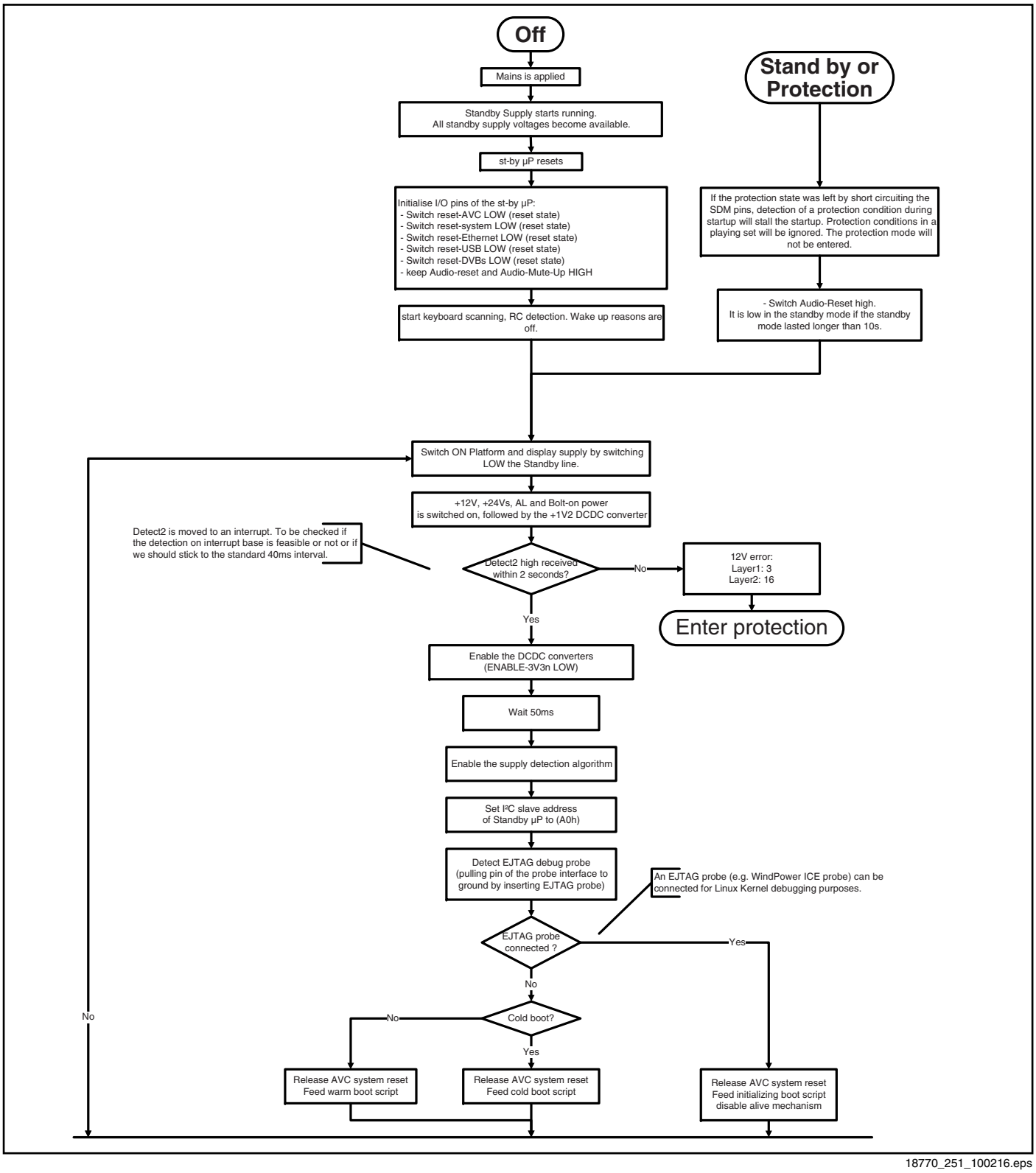
Figure 5-3 Transition diagram


Off
Mains is applied
Standby Supply starts running.
All standby supply voltages become available.
st-by µP resets
Initialise I/O pins of the st-by µP:
- Switch reset-AVC LOW (reset state)
- Switch reset-system LOW (reset state)
- Switch reset-Ethernet LOW (reset state)
- Switch reset-USB LOW (reset state)
- Switch reset-DVBs LOW (reset state)
- keep Audio-reset and Audio-Mute-Up HIGH
start keyboard scanning, RC detection. Wake up reasons are off.
Stand by or Protection
If the protection state was left by short circuiting the SDM pins, detection of a protection condition during startup will stall the startup. Protection conditions in a playing set will be ignored. The protection mode will not be entered.
- Switch Audio-Reset high.
It is low in the standby mode if the standby mode lasted longer than 10s.
Switch ON Platform and display supply by switching LOW the Standby line.
+12V, +24Vs, AL and Bolt-on power is switched on, followed by the +1V2 DCDC converter
Detect2 is moved to an interrupt. To be checked if the detection on interrupt base is feasible or not or if we should stick to the standard 40ms interval.
Detect2 high received within 2 seconds?
No
12V error:
Layer1: 3
Layer2: 16
Enter protection
Yes
Enable the DCDC converters (ENABLE-3V3n LOW)
Wait 50ms
Enable the supply detection algorithm
Set I²C slave address of Standby µP to (A0h)
Detect EJTAG debug probe (pulling pin of the probe interface to ground by inserting EJTAG probe)
An EJTAG probe (e.g. WindPower ICE probe) can be connected for Linux Kernel debugging purposes.
EJTAG probe connected ?
Yes
No
Cold boot?
No
Yes
No
Release AVC system reset
Feed warm boot script
Release AVC system reset
Feed cold boot script
Release AVC system reset
Feed initializing boot script
disable alive mechanism

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100216

Figure 5-4 “Off” to “Semi Stand-by” flowchart (part 1)

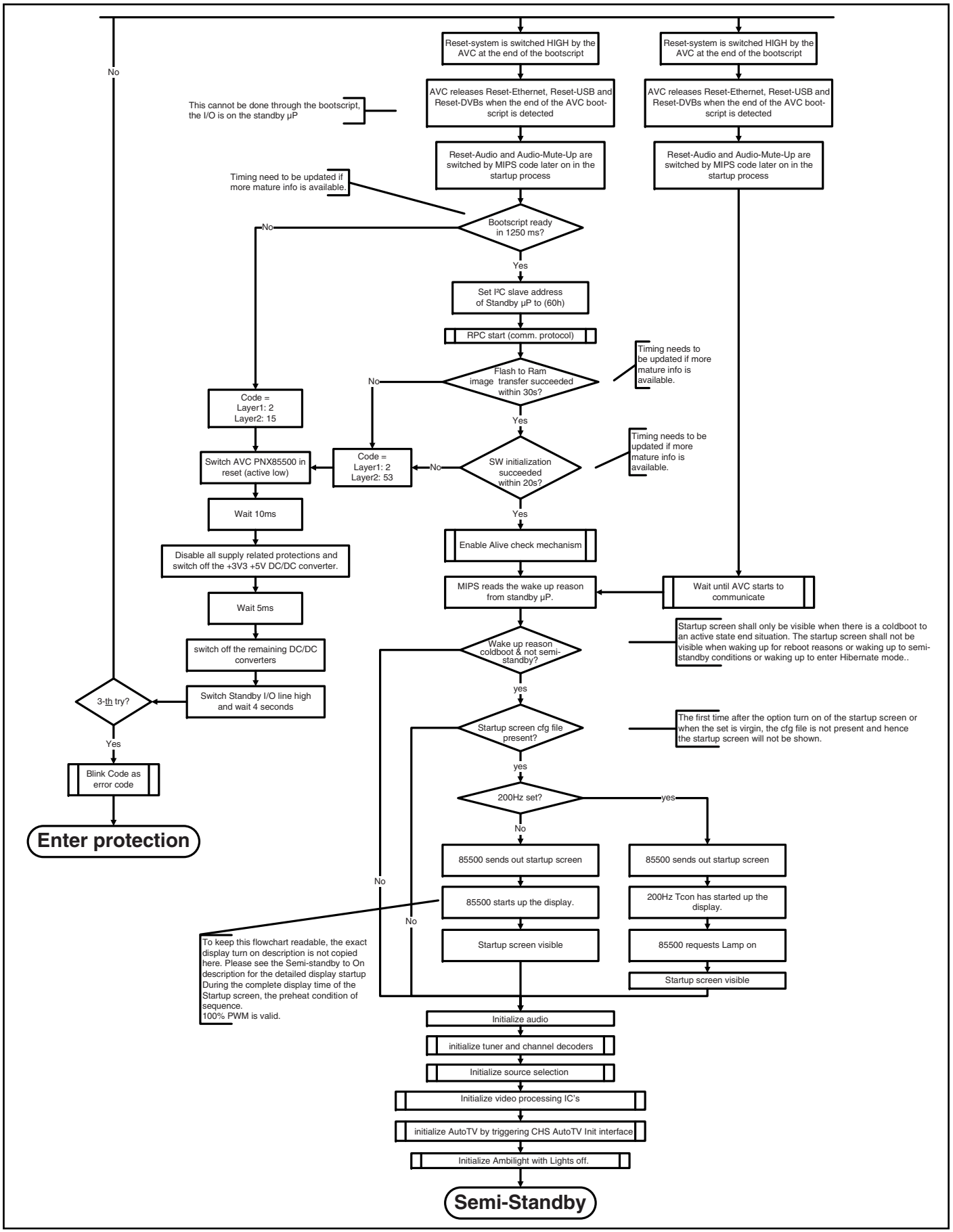
Reset-system is switched HIGH by the AVC at the end of the bootscript
AVC releases Reset-Ethernet, Reset-USB and Reset-DVBs when the end of the AVC boot-script is detected
This cannot be done through the bootscript, the I/O is on the standby µP
Reset-Audio and Audio-Mute-Up are switched by MIPS code later on in the startup process
Timing need to be updated if more mature info is available.
Bootscript ready in 1250 ms?
No
Yes
Set I²C slave address of Standby µP to (60h)
RPC start (comm. protocol)
Flash to Ram image transfer succeeded within 30s?
Timing needs to be updated if more mature info is available.
Code = Layer1: 2 Layer2: 15
Code = Layer1: 2 Layer2: 53
SW initialization succeeded within 20s?
Timing needs to be updated if more mature info is available.
Switch AVC PNX85500 in reset (active low)
Wait 10ms
Disable all supply related protections and switch off the +3V3 +5V DC/DC converter.
Wait 5ms
switch off the remaining DC/DC converters
Switch Standby I/O line high and wait 4 seconds
3-th try?
Blink Code as error code
Enter protection
Enable Alive check mechanism
MIPS reads the wake up reason from standby µP.
Wait until AVC starts to communicate
Wake up reason coldboot & not semi-standby?
Startup screen shall only be visible when there is a coldboot to an active state end situation. The startup screen shall not be visible when waking up for reboot reasons or waking up to semi-standby conditions or waking up to enter Hibernate mode..
yes
Startup screen cfg file present?
The first time after the option turn on of the startup screen or when the set is virgin, the cfg file is not present and hence the startup screen will not be shown.
200Hz set?
85500 sends out startup screen
85500 starts up the display.
Startup screen visible
200Hz Tcon has started up the display.
85500 requests Lamp on
To keep this flowchart readable, the exact display turn on description is not copied here. Please see the Semi-standby to On description for the detailed display startup During the complete display time of the Startup screen, the preheat condition of sequence.
100% PWM is valid.
Initialize audio
initialize tuner and channel decoders
Initialize source selection
Initialize video processing IC's
initialize AutoTV by triggering CHS AutoTV Init interface
Initialize Ambilight with Lights off.
Semi-Standby

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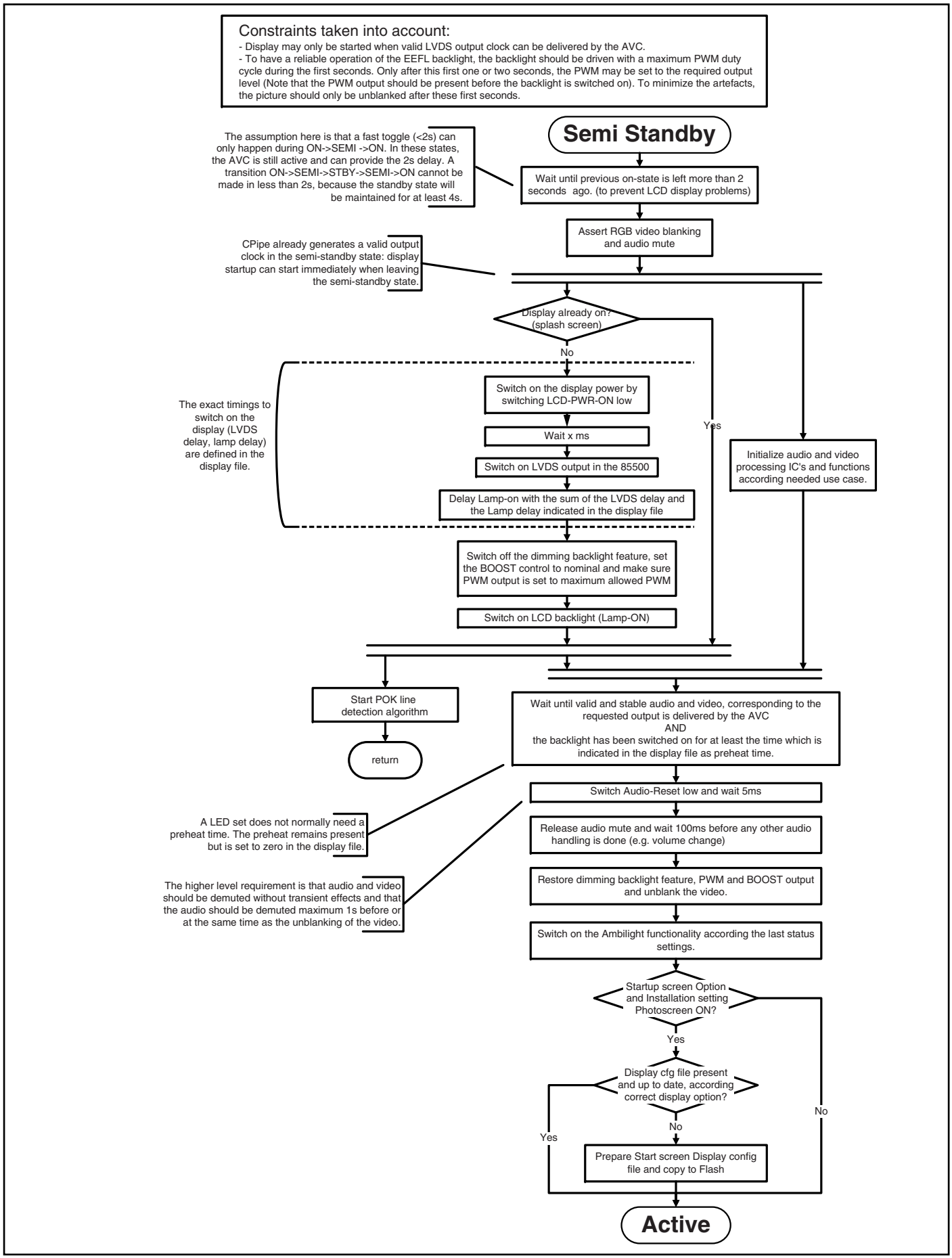
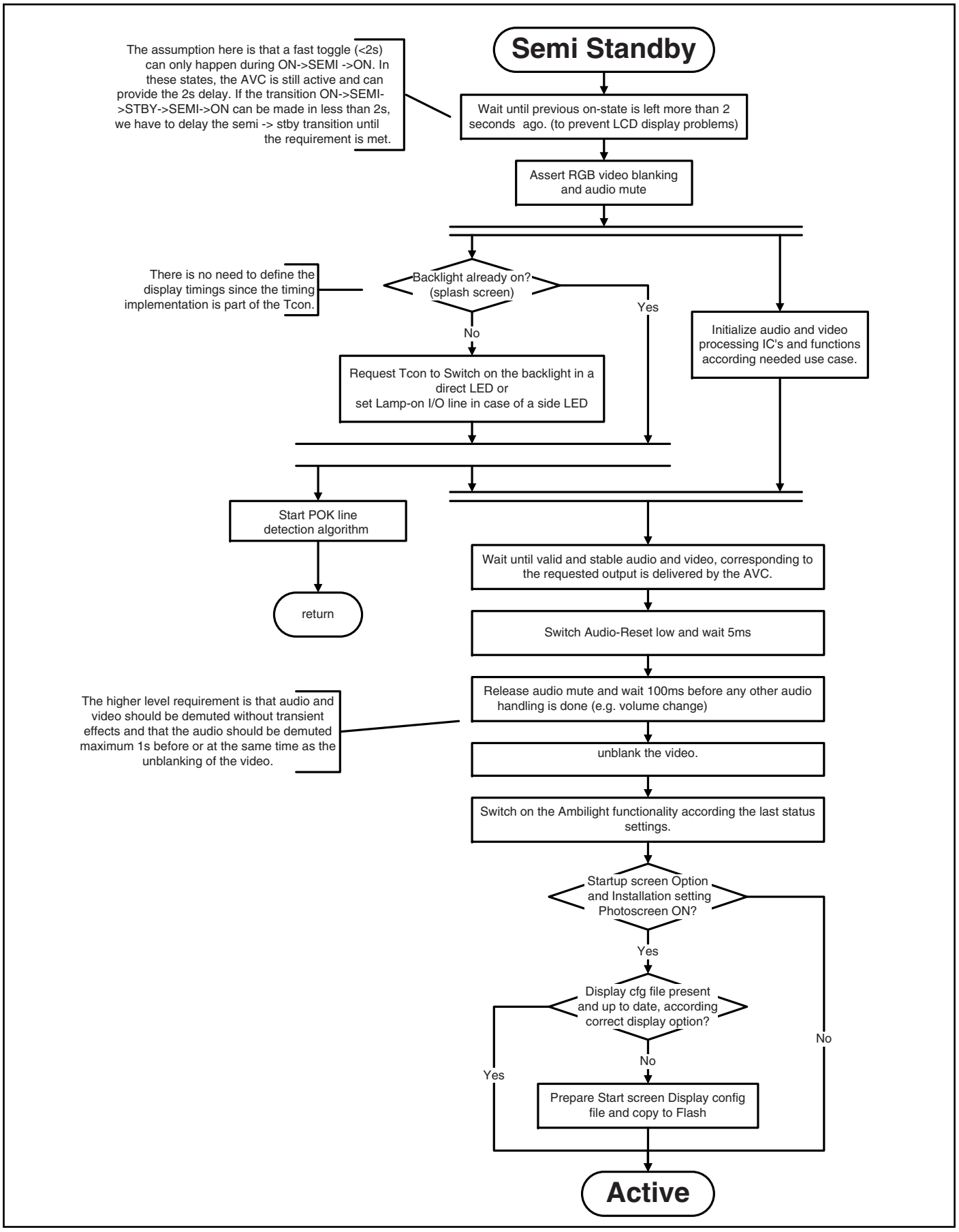
Figure 5-5 "Off" to "Semi Stand-by" flowchart (part 2)


Constraints taken into account:
- Display may only be started when valid LVDS output clock can be delivered by the AVC.
- To have a reliable operation of the EEFL backlight, the backlight should be driven with a maximum PWM duty cycle during the first seconds. Only after this first one or two seconds, the PWM may be set to the required output level (Note that the PWM output should be present before the backlight is switched on). To minimize the artefacts, the picture should only be unblanked after these first seconds.
Semi Standby
The assumption here is that a fast toggle (<2s) can only happen during ON->SEMI ->ON. In these states, the AVC is still active and can provide the 2s delay. A transition ON->SEMI->STBY->SEMI->ON cannot be made in less than 2s, because the standby state will be maintained for at least 4s.
Wait until previous on-state is left more than 2 seconds ago. (to prevent LCD display problems)
Assert RGB video blanking and audio mute
CPipe already generates a valid output clock in the semi-standby state: display startup can start immediately when leaving the semi-standby state.
Display already on? (splash screen)
No
Yes
The exact timings to switch on the display (LVDS delay, lamp delay) are defined in the display file.
Switch on the display power by switching LCD-PWR-ON low
Wait x ms
Switch on LVDS output in the 85500
Delay Lamp-on with the sum of the LVDS delay and the Lamp delay indicated in the display file
Initialize audio and video processing IC's and functions according needed use case.
Switch off the dimming backlight feature, set the BOOST control to nominal and make sure PWM output is set to maximum allowed PWM
Switch on LCD backlight (Lamp-ON)
Start POK line detection algorithm
return
Wait until valid and stable audio and video, corresponding to the requested output is delivered by the AVC
AND
the backlight has been switched on for at least the time which is indicated in the display file as preheat time.
A LED set does not normally need a preheat time. The preheat remains present but is set to zero in the display file.
Switch Audio-Reset low and wait 5ms
Release audio mute and wait 100ms before any other audio handling is done (e.g. volume change)
The higher level requirement is that audio and video should be demuted without transient effects and that the audio should be demuted maximum 1s before or at the same time as the unblanking of the video.
Restore dimming backlight feature, PWM and BOOST output and unblank the video.
Switch on the Ambilight functionality according the last status settings.
Startup screen Option and Installation setting Photoscreen ON?
Yes
Display cfg file present and up to date, according correct display option?
No
Yes
No
Prepare Start screen Display config file and copy to Flash
Active

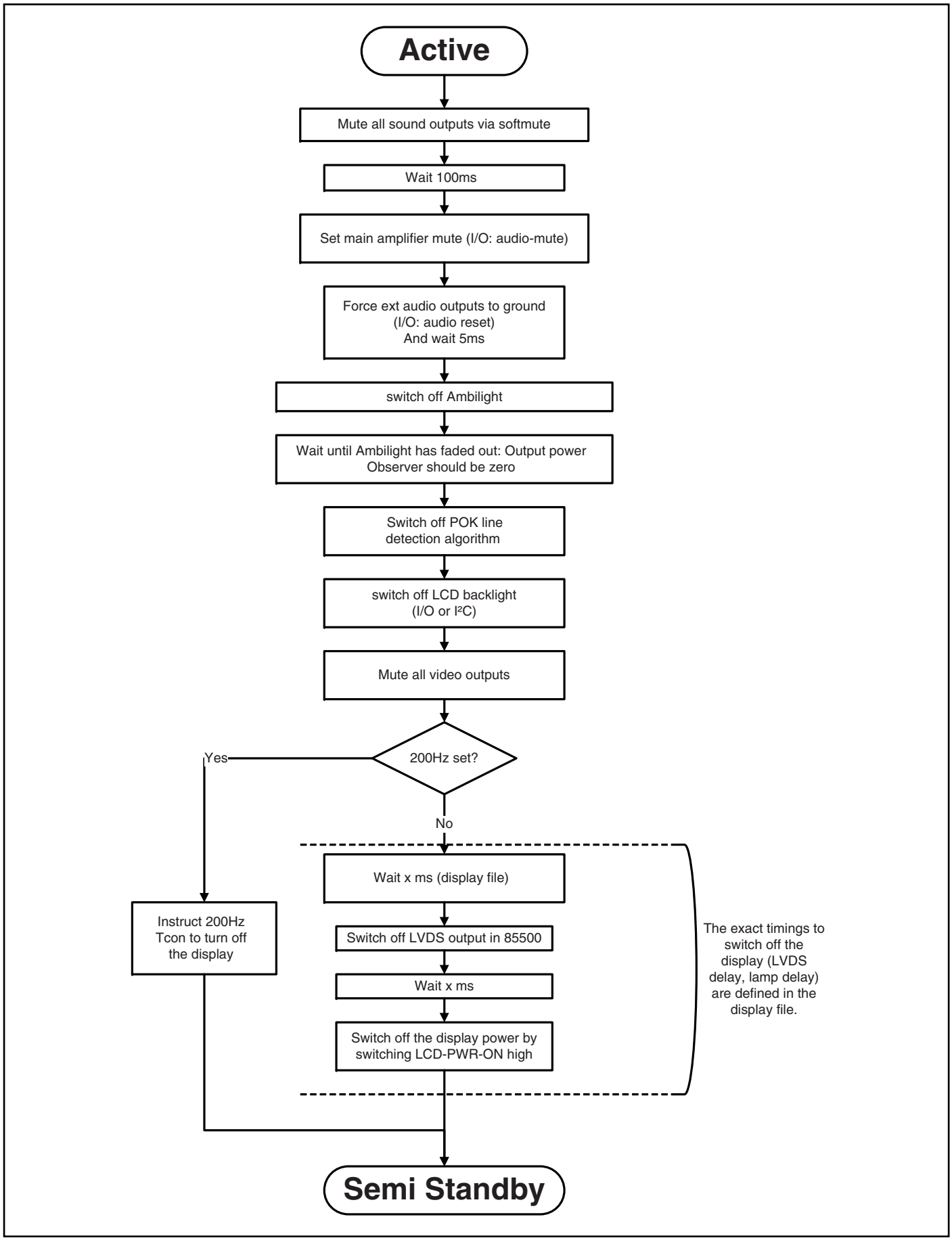
18770_253_100216.eps
100216

Figure 5-6 “Semi Stand-by” to “Active” flowchart (EEFL or LED backlight 50/100 Hz only)


Semi Standby
The assumption here is that a fast toggle (<2s) can only happen during ON->SEMI ->ON. In these states, the AVC is still active and can provide the 2s delay. If the transition ON->SEMI->STBY->SEMI->ON can be made in less than 2s, we have to delay the semi -> stby transition until the requirement is met.
Wait until previous on-state is left more than 2 seconds ago. (to prevent LCD display problems)
Assert RGB video blanking and audio mute
There is no need to define the display timings since the timing implementation is part of the Tcon.
Backlight already on? (splash screen)
Yes
No
Request Tcon to Switch on the backlight in a direct LED or set Lamp-on I/O line in case of a side LED
Initialize audio and video processing IC's and functions according needed use case.
Start POK line detection algorithm
return
Wait until valid and stable audio and video, corresponding to the requested output is delivered by the AVC.
Switch Audio-Reset low and wait 5ms
Release audio mute and wait 100ms before any other audio handling is done (e.g. volume change)
The higher level requirement is that audio and video should be demuted without transient effects and that the audio should be demuted maximum 1s before or at the same time as the unblanking of the video.
unblank the video.
Switch on the Ambilight functionality according the last status settings.
Startup screen Option and Installation setting Photoscreen ON?
Yes
No
Display cfg file present and up to date, according correct display option?
Yes
No
Prepare Start screen Display config file and copy to Flash
Active

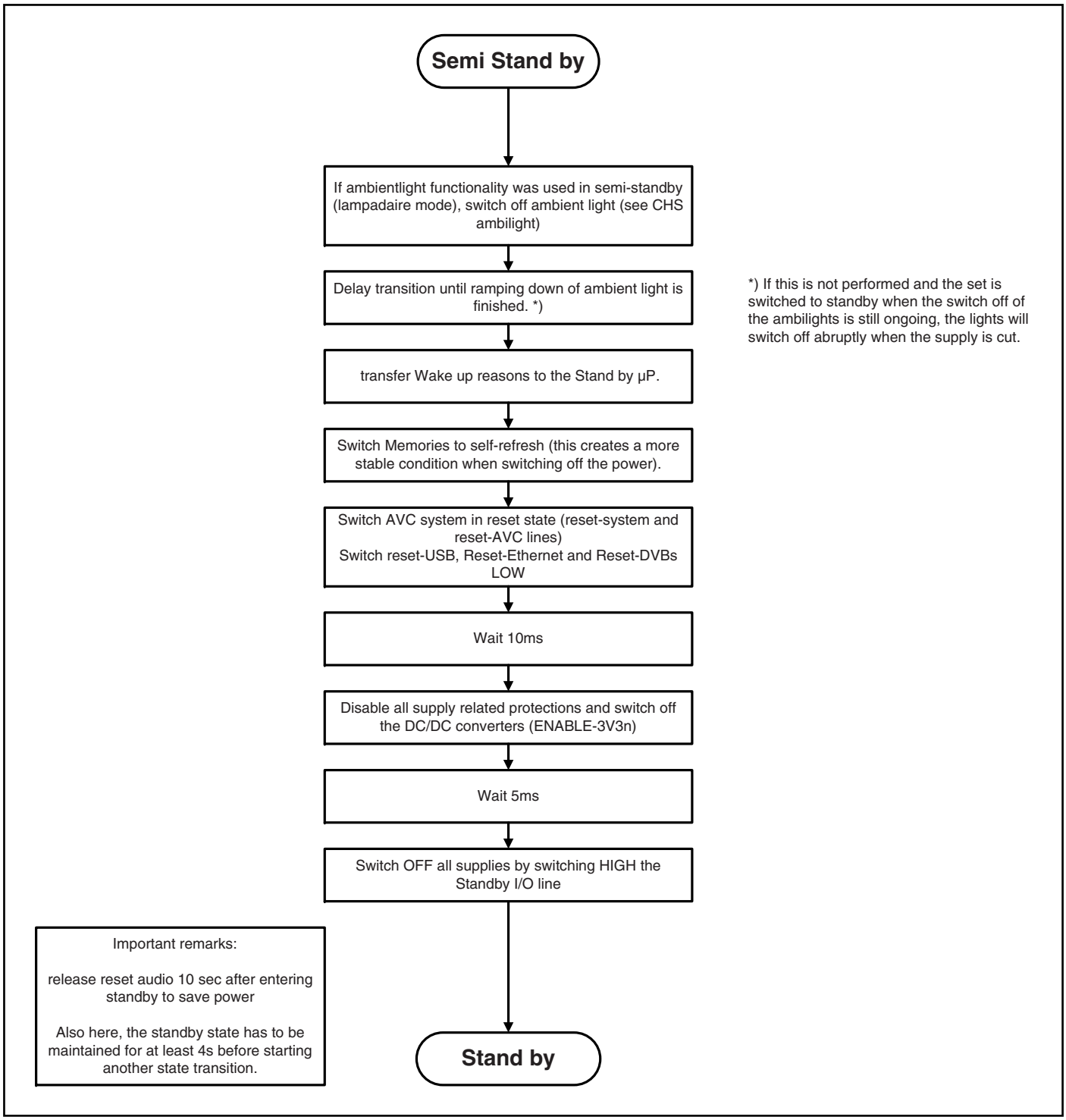
18770_254_100216.eps
100216

Figure 5-7 “Semi Stand-by” to “Active” flowchart (LED backlight 200 Hz)



18770_255_100216.eps
100216

Figure 5-8 “Active” to “Semi Stand-by” flowchart


Semi Stand by
If ambientlight functionality was used in semi-standby (lampadaire mode), switch off ambient light (see CHS ambilight)
Delay transition until ramping down of ambient light is finished. *)
transfer Wake up reasons to the Stand by µP.
Switch Memories to self-refresh (this creates a more stable condition when switching off the power).
Switch AVC system in reset state (reset-system and reset-AVC lines)
Switch reset-USB, Reset-Ethernet and Reset-DVBs LOW
Wait 10ms
Disable all supply related protections and switch off the DC/DC converters (ENABLE-3V3n)
Wait 5ms
Switch OFF all supplies by switching HIGH the Standby I/O line
Stand by
*) If this is not performed and the set is switched to standby when the switch off of the ambilights is still ongoing, the lights will switch off abruptly when the supply is cut.
Important remarks:
release reset audio 10 sec after entering standby to save power
Also here, the standby state has to be maintained for at least 4s before starting another state transition.

18770_256_100216.eps
100216

Figure 5-9 “Semi Stand-by” to “Stand-by” flowchart

5.4 Service Tools

5.4.1 ComPair

Introduction

ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products. and offers the following:

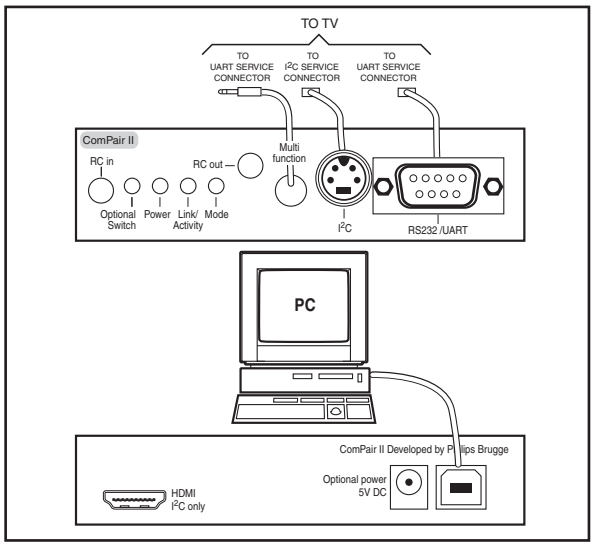
1. ComPair helps to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. No knowledge on I²C or UART commands is necessary, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the µP is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair II interface box is connected **to the PC** via an USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).
The ComPair fault finding program is able to determine the problem of the defective television, by a combination of automatic diagnostics and an interactive question/answer procedure.

How to Connect

This is described in the chassis fault finding database in ComPair.



10000_036_090121.eps
091118

Figure 5-10 ComPair II interface connection

Caution: It is compulsory to connect the TV to the PC as shown in the picture above (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be blown!

How to Order

ComPair II order codes:

- ComPair II interface: 3122 785 91020.
- Software is available via the Philips Service web portal.
- ComPair UART interface cable for Q55x.x. (using 3.5 mm Mini Jack connector): 3138 188 75051.

Note: While encounting problems, contact the local support desk.

5.5 Error Codes

5.5.1 Introduction

The error code buffer contains all detected errors since the last time the buffer was erased. The buffer is written from left to right, new errors are logged at the left side, and all other errors shift one position to the right.
When an error occurs, it is added to the list of errors, provided the list is not full. When an error occurs and the error buffer is full, then the new error is not added, and the error buffer stays intact (history is maintained).
To prevent that an occasional error stays in the list forever, the error is removed from the list after more than 50 hrs. of operation.
When multiple errors occur (errors occurred within a short time span), there is a high probability that there is some relation between them.

New in this chassis is the way errors can be displayed:

- **If no errors are there, the LED should not blink at all in CSM or SDM. No spacer must be displayed as well.**
- **There is a simple blinking LED procedure for board level repair (home repair) so called LAYER 1 errors** next to the existing errors which are LAYER 2 errors (see Table 5-2).
  - LAYER 1 errors are one digit errors.
  - LAYER 2 errors are 2 digit errors.
- **In protection mode**.
  - From consumer mode: **LAYER 1.**
  - From SDM mode: **LAYER 2**.
- **Fatal errors, if I2C bus is blocked and the set reboots, CSM and SAM are not selectable**.
  - From consumer mode: **LAYER 1.**
  - From SDM mode: **LAYER 2**.
- In CSM mode.
  - When entering CSM: error **LAYER 1** will be displayed by blinking LED. Only the latest error is shown.
- In SDM mode.
  - When SDM is entered via Remote Control code or the hardware pins, **LAYER 2** is displayed via blinking LED.
- Error display on screen.
  - In CSM no error codes are displayed on screen.
  - In SAM the complete error list is shown.

Basically there are three kinds of errors:

- **Errors detected by the Stand-by software which lead to protection.** These errors will always lead to protection and an automatic start of the blinking LED LAYER 1 error. (see section "5.6 The Blinking LED Procedure").
- **Errors detected by the Stand-by software which not lead to protection.** In this case the front LED should blink the involved error. See also section "5.5 Error Codes, 5.5.4 Error Buffer, Extra Info". Note that it can take up several minutes before the TV starts blinking the error (e.g. LAYER 1 error = 2, LAYER 2 error = 15 or 53).
- **Errors detected by main software (MIPS).** In this case the error will be logged into the error buffer and can be read out via ComPair, via blinking LED method LAYER 1-2 error, or in case picture is visible, via SAM.

5.5.2 How to Read the Error Buffer

Use one of the following methods:

- On screen via the SAM (only when a picture is visible). E.g.:
  - **00 00 00 00 00**: No errors detected
  - **23 00 00 00 00**: Error code 23 is the last and only detected error.
  - **37 23 00 00 00**: Error code 23 was first detected and error code 37 is the last detected error.
  - **Note that no protection errors can be logged in the error buffer.**

- Via the blinking LED procedure. See section 5.5.3 How to Clear the Error Buffer.
- Via ComPair.

5.5.3 How to Clear the Error Buffer

Use one of the following methods:
- By activation of the "RESET ERROR BUFFER" command in the SAM menu.
- If the content of the error buffer has not changed for 50+ hours, it resets automatically.

5.5.4 Error Buffer

In case of non-intermittent faults, clear the error buffer before starting to repair (**before** clearing the buffer, write down the content, as this history can give significant information). This to ensure that old error codes are no longer present.
If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error code and not the actual cause (e.g. a fault in the protection detection circuitry can also lead to a protection).
There are several mechanisms of error detection:
- Via error bits in the status registers of ICs.
- Via polling on I/O pins going to the stand-by processor.
- Via sensing of analogue values on the stand-by processor or the PNX85500.
- Via a "not acknowledge" of an I^2C communication.

Take notice that some errors need several minutes before they start blinking or before they will be logged. So in case of problems wait 2 minutes from start-up onwards, and then check if the front LED is blinking or if an error is logged.

Table 5-2 Error code overview

Description	Layer 1	Layer 2	Monitored by	Error/ Prot	Error Buffer/ Blinking LED	Device	Defective Board
I^2C3	2	13	MIPS	E	BL / EB	SSB	SSB
I^2C2	2	14	MIPS	E	BL / EB	SSB	SSB
I^2C4	2	18	MIPS	E	BL / EB	SSB	SSB
PNX doesn't boot (HW cause)	2	15	Stby µP	P	BL	PNX8550	SSB
12V	3	16	Stby µP	P	BL	/	Supply
Inverter or display supply	3	17	MIPS	E	EB	/	Supply
HDMI mux	2	23	MIPS	E	EB	Sil9x87A	SSB
I2C switch	2	24	MIPS	E	EB	PCA9540	SSB
Channel dec DVB-S	2	28	MIPS	E	EB	STV0903	SSB
Lnb controller	2	31	MIPS	E	EB	LNBH23	SSB
Tuner	2	34	MIPS	E	EB	DTT 71300	SSB
Main nvm	2	35	MIPS	E	EB	STM24C64	SSB
Tuner DVB-S	2	36	MIPS	E	EB	STV6110	SSB
T° sensor SSB/set	2	42	MIPS	E	EB	LM 75	T° sensor
T° sensor LED driver/Tcon	7	42	MIPS	E	EB	LM 75	T° sensor
PNX doesn't boot (SW cause)	2	53	Stby µP	P	BL	PNX8550	SSB
Display	5	64	MIPS	E	BL / EB	Altera	Display

Extra Info
- **Rebooting.** When a TV is constantly rebooting due to internal problems, most of the time no errors will be logged or blinked. This rebooting can be recognized via a ComPair interface and Hyperterminal (for Hyperterminal settings, see section "5.8 Fault Finding and Repair Tips, 5.8.6 Logging). It's shown that the loggings which are generated by the main software keep continuing. In this case diagnose has to be done via ComPair.
- **Error 13 (I^2C bus 3, SSB bus blocked)**. At the time of release of this manual, this error was not working as expected. Current situation: when this error occurs, the TV will constantly reboot due to the blocked bus. The best way for further diagnosis here, is to use ComPair.
- **Error 14 (I^2C bus 2, TV set bus blocked)**. At the time of release of this manual, this error was not working as expected. Current situation: when this error occurs, the TV will constantly reboot due to the blocked bus. The best way for further diagnosis here, is to use ComPair.
- **Error 18 (I^2C bus 4, Tuner bus blocked)**. At the time of release of this manual, this error was not working as expected. Current situation: when this error occurs, the TV will constantly reboot due to the blocked bus. The best way for further diagnosis here, is to use ComPair.
- **Error 15 (PNX8550 doesn't boot)**. Indicates that the main processor was not able to read his bootscript. This error will point to a hardware problem around the PNX8550 (supplies not OK, PNX 8550 completely dead, I^2C link between PNX and Stand-by Processor broken, etc...). When error 15 occurs it is also possible that I^2C1 bus is blocked (NVM). I^2C1 can be indicated in the schematics as follows: SCL-UP-MIPS, SDA-UP-MIPS.
Other root causes for this error can be due to hardware problems regarding the DDR's and the bootscript reading from the PNX8550.
- **Error 16 (12V)**. This voltage is made in the power supply and results in protection (LAYER 1 error = 3) in case of absence. When SDM is activated we see blinking LED LAYER 2 error = 16.
- **Error 17 (Invertor or Display Supply)**. Here the status of the "Power OK" is checked by software, no protection will occur during failure of the invertor or display supply (no picture), only error logging. LED blinking of LAYER 1 error = 3 in CSM, in SDM this gives LAYER 2 error = 17.
- **Error 23 (HDMI)**. When there is no I^2C communication towards the HDMI mux after start-up, LAYER 2 error = 23 will be logged and displayed via the blinking LED procedure if SDM is switched "on".
- **Error 24 (I2C switch)**. When there is no I^2C communication towards the I^2C switch, LAYER 2 error = 24 will be logged and displayed via the blinking LED procedure when SDM is switched "on". Remark : this only works for TV sets with an I^2C controlled screen included.
- **Error 28 (Channel dec DVB-S)**. When there is no I^2C communication towards the DVB-S channel decoder, LAYER 2 error = 28 will be logged and displayed via the blinking LED procedure if SDM is switched "on".
- **Error 31 (Lnb controller)**. When there is no I^2C communication towards this device, LAYER 2 error = 31

will be logged and displayed via the blinking LED procedure if SDM is activated.
- **Error 34 (Tuner)**. When there is no I²C communication towards the tuner during start-up, LAYER 2 error = 34 will be logged and displayed via the blinking LED procedure when SDM is switched “on”.
- **Error 35 (main NVM)**. When there is no I²C communication towards the main NVM during start-up, LAYER 2 error = 35 will be displayed via the blinking LED procedure when SDM is switched “on”. All service modes (CSM, SAM and SDM) are accessible during this failure, observed in the Uart logging as follows : "<< ERRO >>> PFPOW_.C : First Error (id19, Layer_1= 2 Layer_= 35)".
- **Error 36 (Tuner DVB-S)**. When there is no I²C communication towards the DVB-S tuner during start-up, LAYER 2 error = 36 will be logged and displayed via the blinking LED procedure when SDM is switched “on”.
- **Error 42 (Temp sensor)**. Only applicable for TV sets equipped with temperature devices.
- **Error 53**. This error will indicate that the PNX8550 has read his bootscript (when this would have failed, error 15 would blink) but initialization was never completed because of hardware problems (NAND flash, ...) or software initialization problems. Possible cause could be that there is no valid software loaded (try to upgrade to the latest main software version). Note that it can take a few minutes before the TV starts blinking LAYER 1 error = 2 or in SDM, LAYER 2 error = 53.
- **Error 64**. Only applicable for TV sets with an I²C controlled screen .

5.6 The Blinking LED Procedure

5.6.1 Introduction

The blinking LED procedure can be split up into two situations:
- **Blinking LED procedure LAYER 1 error.** In this case the error is automatically blinked when the TV is put in CSM. This will be only one digit error, namely the one that is referring to the defective board (see table “5-2 Error code overview”) which causes the failure of the TV. This approach will especially be used for home repair and call centres. The aim here is to have service diagnosis from a distance.
- **Blinking LED procedure LAYER 2 error.** Via this procedure, the contents of the error buffer can be made visible via the front LED. In this case the error contains 2 digits (see table “5-2 Error code overview”) and will be displayed when SDM (hardware pins) is activated. This is especially useful for fault finding and gives more details regarding the failure of the defective board.

Important remark:
For an empty error buffer, the LED should not blink at all in CSM or SDM. No spacer will be displayed.

When one of the blinking LED procedures is activated, the front LED will show (blink) the contents of the error buffer. Error codes greater then 10 are shown as follows:
1. “n” long blinks (where “n” = 1 to 9) indicating decimal digit
2. A pause of 1.5 s
3. “n” short blinks (where “n”= 1 to 9)
4. A pause of approximately 3 s,
5. When all the error codes are displayed, the sequence finishes with a LED blink of 3 s (spacer).
6. The sequence starts again.

Example: Error 12 8 6 0 0.
After activation of the SDM, the front LED will show:
1. One long blink of 750 ms (which is an indication of the decimal digit) followed by a pause of 1.5 s
2. Two short blinks of 250 ms followed by a pause of 3 s
3. Eight short blinks followed by a pause of 3 s
4. Six short blinks followed by a pause of 3 s
5. One long blink of 3 s to finish the sequence (spacer).
6. The sequence starts again.

5.6.2 How to Activate

Use one of the following methods:
- **Activate the CSM**. The blinking front LED will show only the latest layer 1 error, this works in “normal operation” mode or automatically when the error/protection is monitored by the standby processor.
  In case no picture is shown and there is no LED blinking, read the logging to detect whether “error devices” are mentioned. (see section “5.8 Fault Finding and Repair Tips, 5.8.6 Logging”).
- **Activate the SDM**. The blinking front LED will show the entire content of the LAYER 2 error buffer, this works in “normal operation” mode or when SDM (via hardware pins) is activated when the tv set is in protection.

5.7 Protections

5.7.1 Software Protections

Most of the protections and errors use either the stand-by microprocessor or the MIPS controller as detection device. Since in these cases, checking of observers, polling of ADCs, and filtering of input values are all heavily software based, these protections are referred to as software protections. There are several types of software related protections, solving a variety of fault conditions:
- **Related to supplies:** presence of the +5V, +3V3 and 1V2 needs to be measured, no protection triggered here.
- **Protections related to breakdown of the safety check mechanism.** E.g. since the protection detections are done by means of software, failing of the software will have to initiate a protection mode since safety cannot be guaranteed any more.

Remark on the Supply Errors
The detection of a supply dip or supply loss during the normal playing of the set does not lead to a protection, but to a cold reboot of the set. If the supply is still missing after the reboot, the TV will go to protection.

Protections during Start-up
During TV start-up, some voltages and IC observers are actively monitored to be able to optimise the start-up speed, and to assure good operation of all components. If these monitors do not respond in a defined way, this indicates a malfunction of the system and leads to a protection. As the observers are only used during start-up, they are described in the start-up flow in detail (see section “5.3 Stepwise Start-up”).

5.7.2 Hardware Protections

The only real hardware protection in this chassis appears in case of an audio problem e.g. DC voltage on the speakers. This protection will only affect the Class D audio amplifier (item 7D10; see diagram B03A) and puts the amplifier in a continuous burst mode (cyclus approximately 2 seconds).

Repair Tip
- There still will be a picture available but no sound. While the Class D amplifier tries to start-up again, the cone of the loudspeakers will move slowly in one or the other direction until the initial failure shuts the amplifier down, this cyclus starts over and over again. The headphone amplifier will also behaves similar.

5.8 Fault Finding and Repair Tips

Read also section "5.5 Error Codes, 5.5.4 Error Buffer, Extra Info".

5.8.1 Ambilight

Due to degeneration process of the LED's fitted on the ambi module, there can be a difference in the colour and/or light output of the spare ambilight modules in comparison with the originals ones contained in the TV set. Via SAM => alignments => ambilight, the spare module can be adjusted.

5.8.2 Audio Amplifier

The Class D-IC 7D10 has a powerpad for cooling. When the IC is replaced it must be ensured that the powerpad is very well pushed to the PWB while the solder is still liquid. This is needed to insure that the cooling is guaranteed, otherwise the Class D-IC could break down in short time.

5.8.3 CSM

When CSM is activated and there is a USB stick connected to the TV, the software will dump the complete CSM content to the USB stick. The file (Csm.txt) will be saved in the root of the USB stick. If this mechanism works it can be concluded that a large part of the operating system is already working (MIPS, USB...)

5.8.4 DC/DC Converter

Description basic board

The basic board power supply consists of 4 DC/DC converters and 5 linear stabilisers. All DC/DC converters have +12V input voltage and deliver :

- +1V1 supply voltage (1.15V nominal), for the core voltage of PNX85500, stabilised close to the point of load; SENSE+1V1 signal provides the DC-DC converter the needed feedback to achieve this.
- +1V8 supply voltage, for the DDR2 memories and DDR2 interface of PNX85500.
- +3V3 supply voltage (3.30V nominal), overall 3.3 V for onboard IC's, for non-5000 series SSB diversities only.
- +5V (5.15V nominal) for USB, WIFI and Conditional Access Module and +5V5-TUN for +5V-TUN tuner stabiliser.

The linear stabilisers are providing:

- +1V2 supply voltage (1.2V nominal), stabilised close to PNX85500 device, for various other internal blocks of PNX85500; SENSE+1V2 signal provides the needed feedback to achieve this.
- +2V5 supply voltage (2.5V nominal) for LVDS interface and various other internal blocks of PNX85500; for 5000 series SSB diversities the stabiliser is 7UD2 while for the other diversities 7UC0 is used.
- +3V3 supply voltage (3V3 nominal) for 5000 series SSB diversities, provided by 7UD3; in this case the 12V to 3V3 DC-DC converter is not present.
- +5V-TUN supply voltage (5V nominal) for tuner and IF amplifier.

+3V3-STANDY (3V3 nominal) is the permanent voltage, supplying the standby microprocessor inside PNX85500.

Supply voltage +1V1 is started immediately when +12V voltage becomes available (+12V is enabled by STANDBY signal when "low"). Supply voltages +3V3, +2V5, +1V8, +1V2 and +5V-TUN are switched "on" by signal ENABLE-3V3 when 'low", provided that +12V (detected via 7U40 and 7U41) is present.

+12V is considered OK (=> DETECT2 signal becomes "high", +12V to +1V8, +12V to +3V3, +12V to +5V DC-DC converter can be started up) if it rises above 10V and doesn't drop below 9V5. A small delay of a few milliseconds is introduced between the start-up of 12V to +1V8 DC-DC converter and the two other DC-DC converters via 7U48 and associated components.

Description DVB-S2:

- LNB-RF1 (0V = disabled, 14V or 18V in normal operation) LNB supply generated via the second conversion channel of 7T03 followed by 7T50 LNB supply control IC.It provides supply voltage that feeds the outdoor satellite reception equipment.
- +3V3-DVBS (3V3 nominal), +2V5-DVBS (2V5 nominal) and +1V-DVBS (1.03V nominal) power supply for the silicon tuner and channel decoder. +1V-DVBS is generated via a 5V to 1V DC-DC converter and is stabilised at the point of load (channel decoder) by means of feedback signal SENSE+1V0-DVBS. +3V3-DVBS and +2V5-DVBS are generated via linear stabilisers from +5V-DVBS that by itself is generated via the first conversion channel of 7T03.

At start-up, +24V becomes available when STANDBY signal is "low" (together with +12V for the basic board), when +3V3 from the basic board is present the two DC-DC converters channels inside 7T03 are activated. Initially only the 24V to 5V converter (channel 1 of 7T03 generating +5V-DVBS) will effectively work, while +V-LNB is held at a level around 11V7 via diode 6T55. After 7T05 is initialized, the second channel of 7T03 will start and generates a voltage higher then LNB-RF1 with 0V8. +5V-DVBS start-up will imply +3V3-DVBS start-up, with a small delay of a few milliseconds => +2V5-DVBS and +1V-DVBS will be enabled.

If +24V drops below +15V level then the DVB-S2 supply will stop, even if +3V3 is still present..

Debugging

The best way to find a failure in the DC/DC converters is to check their start-up sequence at power-on via the mains cord, presuming that the standby microprocessor and the external supply are operational. Take STANDBY signal high-to-low transition as time reference.
When +12V becomes available (maximum 1 second after STANDBY signal goes "low") then +1V1 is started immediately. After ENABLE-3V3 goes "low", all the other supply voltages should rise within a few milliseconds.

Tips

- Behaviour comparison with a reference TV550 platform can be a fast way to locate failures.
- If +12V stays "low", check the integrity of fuse 1U40.
- Check the integrity (at least no short circuit between drain and source) of the power MOS-FETs before starting up the platform in SDM, otherwise many components might be damaged. Using a ohmmeter can detect short circuits between any power rail and ground or between +12V and any other power rail.
- Short circuit at the output of an integrated linear stabiliser (7UC0, 7UD2 or 7UD3) will heat up this device strongly.
- Switching frequencies should be 500 kHz ...600 kHz for 12 V to 1.1 V and 12 V to 1.8 V DC-DC converters, 900 kHz for 12 V to 3.3 V and 12 V to 5 V DC-DC converters. The DVB-S2 supply 24 V to 5 V and 24 V to +V LNB DC-DC converters operates at 300 kHz while for 5 V to 1.1 V DC-DC converter 900 kHz is used.

5.8.5 Exit "Factory Mode"

When an "F" is displayed in the screen's right corner, this means the set is in "Factory" mode, and it normally happens after a new SSB is mounted. To exit this mode, push the "VOLUME minus" button on the TV's local keyboard for 10 seconds (this disables the continuous mode).

Then push the “SOURCE” button for 10 seconds until the “F” disappears from the screen.

5.8.6 Logging

When something is wrong with the TV set (f.i. the set is rebooting) you can check for more information via the logging in Hyperterminal. The Hyperterminal is available in every Windows application via Programs, Accessories, Communications, Hyperterminal. Connect a “ComPair UART”-cable (3138 188 75051) from the service connector in the TV to the “multi function” jack at the front of ComPair II box.
Required settings in ComPair before starting to log :
- Start up the ComPair application.
- Select the correct database (open file “Q55X.X”, this will set the ComPair interface in the appropriate mode).
- Close ComPair

After start-up of the Hyperterminal, fill in a name (f.i. “logging”) in the “Connection Description” box, then apply the following settings:

1. COMx
2. Bits per second = 115200
3. Data bits = 8
4. Parity = none
5. Stop bits = 1
6. Flow control = none

During the start-up of the TV set, the logging will be displayed. This is also the case during rebooting of the TV set (the same logging appears time after time). Also available in the logging is the “Display Option Code” (useful when there is no picture), look for item “DisplayRawNumber” in the beginning of the logging. Tip: when there is no picture available during rebooting you are able to check for “error devices” in the logging (LAYER 2 error) which can be very helpful to determine the failure cause of the reboot. For protection state, there is no logging.

5.8.7 Loudspeakers

Make sure that the volume is set to minimum during disconnecting the speakers in the ON-state of the TV. The audio amplifier can be damaged by disconnecting the speakers during ON-state of the set!

5.8.8 PSL

In case of no picture when CSM (test pattern) is activated and backlight doesn’t light up, it’s recommended first to check the inverter on the PSL + wiring (LAYER 2 error = 17 is displayed in SDM).

5.8.9 Tuner

Attention: In case the tuner is replaced, always check the tuner options!

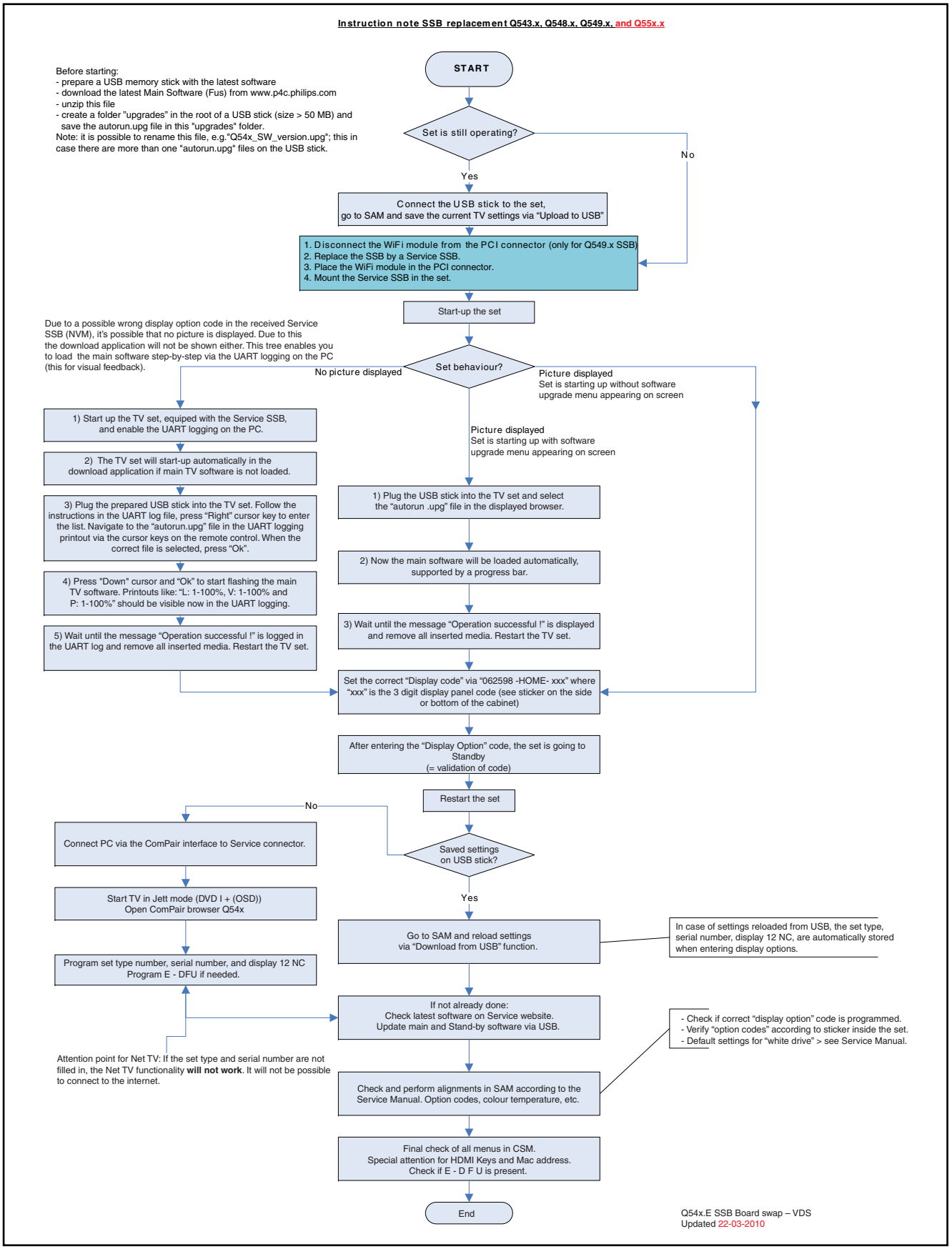
5.8.10 Display option code

Attention: In case the SSB is replaced, always check the display option code in SAM, even when picture is available. Performance with the incorrect display option code can lead to unwanted side-effects for certain conditions.

New in this chassis:
While in the download application (start up in TV mode + “OK” button pressed), the display option code can be changed via 062598 HOME XXX special SAM command (XXX=display option in 3 digits).

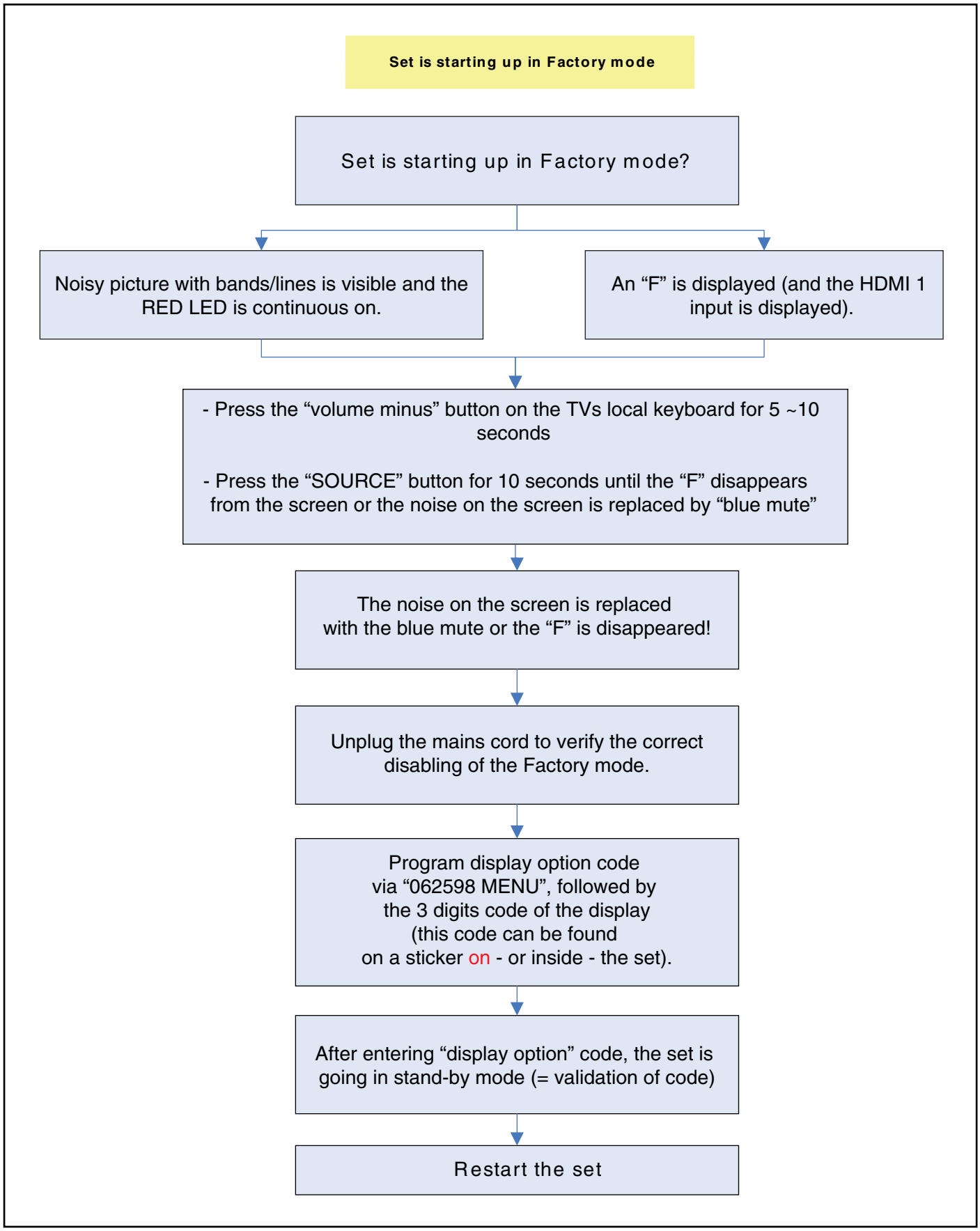
5.8.11 SSB Replacement

Follow the instructions in the flowchart in case a SSB has to be exchanged. See figure “SSB replacement flowchart”.


Instruction note SSB replacement Q543.x, Q548.x, Q549.x, and Q55x.x
Before starting:
- prepare a USB memory stick with the latest software
- download the latest Main Software (Fus) from www.p4c.philips.com
- unzip this file
- create a folder "upgrades" in the root of a USB stick (size > 50 MB) and save the autorun.upg file in this "upgrades" folder.
Note: it is possible to rename this file, e.g."Q54x_SW_version.upg"; this in case there are more than one "autorun.upg" files on the USB stick.
START
Set is still operating?
No
Yes
Connect the USB stick to the set, go to SAM and save the current TV settings via “Upload to USB”
1. Disconnect the WiFi module from the PCI connector (only for Q549.x SSB)
2. Replace the SSB by a Service SSB.
3. Place the WiFi module in the PCI connector.
4. Mount the Service SSB in the set.
Start-up the set
Due to a possible wrong display option code in the received Service SSB (NVM), it's possible that no picture is displayed. Due to this the download application will not be shown either. This tree enables you to load the main software step-by-step via the UART logging on the PC (this for visual feedback).
Set behaviour?
No picture displayed
Picture displayed
Set is starting up without software upgrade menu appearing on screen
1) Start up the TV set, equiped with the Service SSB, and enable the UART logging on the PC.
2) The TV set will start-up automatically in the download application if main TV software is not loaded.
3) Plug the prepared USB stick into the TV set. Follow the instructions in the UART log file, press “Right” cursor key to enter the list. Navigate to the “autorun.upg” file in the UART logging printout via the cursor keys on the remote control. When the correct file is selected, press “Ok”.
4) Press "Down" cursor and “Ok” to start flashing the main TV software. Printouts like: “L: 1-100%, V: 1-100% and P: 1-100%” should be visible now in the UART logging.
5) Wait until the message “Operation successful !” is logged in the UART log and remove all inserted media. Restart the TV set.
Picture displayed
Set is starting up with software upgrade menu appearing on screen
1) Plug the USB stick into the TV set and select the “autorun .upg” file in the displayed browser.
2) Now the main software will be loaded automatically, supported by a progress bar.
3) Wait until the message “Operation successful !” is displayed and remove all inserted media. Restart the TV set.
Set the correct “Display code” via “062598 -HOME- xxx” where “xxx” is the 3 digit display panel code (see sticker on the side or bottom of the cabinet)
After entering the “Display Option” code, the set is going to Standby (= validation of code)
Restart the set
No
Saved settings on USB stick?
Yes
Connect PC via the ComPair interface to Service connector.
Start TV in Jett mode (DVD I + (OSD)) Open ComPair browser Q54x
Program set type number, serial number, and display 12 NC Program E - DFU if needed.
Attention point for Net TV: If the set type and serial number are not filled in, the Net TV functionality will not work. It will not be possible to connect to the internet.
Go to SAM and reload settings via “Download from USB” function.
In case of settings reloaded from USB, the set type, serial number, display 12 NC, are automatically stored when entering display options.
If not already done: Check latest software on Service website. Update main and Stand-by software via USB.
- Check if correct “display option” code is programmed.
- Verify “option codes” according to sticker inside the set.
- Default settings for “white drive” > see Service Manual.
Check and perform alignments in SAM according to the Service Manual. Option codes, colour temperature, etc.
Final check of all menus in CSM. Special attention for HDMI Keys and Mac address. Check if E - D F U is present.
End
Q54x.E SSB Board swap – VDS
Updated 22-03-2010

H_16771_007a.eps
100402

Figure 5-11 SSB replacement flowchart


Set is starting up in Factory mode
Set is starting up in Factory mode?
Noisy picture with bands/lines is visible and the RED LED is continuous on.
An “F” is displayed (and the HDMI 1 input is displayed).
- Press the “volume minus” button on the TVs local keyboard for 5 ~10 seconds
- Press the “SOURCE” button for 10 seconds until the “F” disappears from the screen or the noise on the screen is replaced by “blue mute”
The noise on the screen is replaced with the blue mute or the “F” is disappeared!
Unplug the mains cord to verify the correct disabling of the Factory mode.
Program display option code via “062598 MENU”, followed by the 3 digits code of the display (this code can be found on a sticker on - or inside - the set).
After entering “display option” code, the set is going in stand-by mode (= validation of code)
Restart the set

H_16771_007b.eps
100322

Figure 5-12 SSB replacement flowchart - Factory mode

5.9 Software Upgrading

5.9.1 Introduction

The set software and security keys are stored in a NAND-Flash, which is connected to the PNX85500.

It is possible **for the user** to upgrade the **main** software via the USB port. This allows replacement of a software image in a stand alone set, without the need of an E-JTAG debugger. A description on how to upgrade the main software can be found in the electronic User Manual.

Important: When the NAND-Flash must be replaced, a new SSB must be ordered, due to the presence of the security keys! (CI +, MAC address, ...).
Perform the following actions after SSB replacement:
1. Set the correct option codes (see sticker inside the TV).
2. Update the TV software => see the eUM (electronic User Manual) for instructions.
3. Perform the alignments as described in chapter 6 (section 6.5 Reset of Repaired SSB).
4. Check in CSM if the CI + key, MAC address.. are valid.

For the correct order number of a new SSB, always refer to the Spare Parts list!

5.9.2 Main Software Upgrade

- The “UpgradeAll.upg” file is only used in the factory.

Automatic Software Upgrade
In “normal” conditions, so when there is no major problem with the TV, the main software and the default software upgrade application can be upgraded with the “AUTORUN.UPG” (FUS part of the one-zip file: e.g. 3104 337 05661 _FUS _Q555X_ x.x.x.x_commercial.zip). This can also be done by the consumers themselves, but they will have to get their software from the commercial Philips website or via the Software Update Assistant in the user menu (see eUM). The “autorun.upg” file must be placed in the root of the USB stick.
How to upgrade:
1. Copy “AUTORUN.UPG” to the root of the USB stick.
2. Insert USB stick in the set while the set is operational. The set will restart and the upgrading will start automatically. As soon as the programming is finished, a message is shown to remove the USB stick and restart the set.

Manual Software Upgrade
In case that the software upgrade application does not start automatically, it can also be started manually.
How to start the software upgrade application manually:
1. Disconnect the TV from the Mains/AC Power.
2. Press the “OK” button on a Philips TV remote control or a Philips DVD RC-6 remote control (it is also possible to use a TV remote in “DVD” mode). Keep the “OK” button pressed while reconnecting the TV to the Mains/AC Power.
3. The software upgrade application will start.

Attention!
In case the download application has been started **manually**, the “autorun.upg” will maybe not be recognized.
What to do in this case:
1. Create a directory “UPGRADES” on the USB stick.
2. Rename the “autorun.upg” to something else, e.g. to “software.upg”. Do not use long or complicated names, keep it simple. Make sure that “AUTORUN.UPG” is no longer present in the root of the USB stick.
3. Copy the renamed “upg” file into this directory.
4. Insert USB stick into the TV.
5. The renamed “upg” file will be visible and selectable in the upgrade application.

Back-up Software Upgrade Application
If the default software upgrade application does not start (could be due to a corrupted boot sector) via the above described method, try activating the “back-up software upgrade application”.
How to start the “back-up software upgrade application” manually:
1. Disconnect the TV from the Mains/AC Power.
2. Press the “CURSOR DOWN”-button on a Philips TV remote control while reconnecting the TV to the Mains/AC Power.
3. The back-up software upgrade application will start.

5.9.3 Stand-by Software Upgrade via USB

In this chassis it is possible to upgrade the Stand-by software via a USB stick. The method is similar to upgrading the main software via USB.
Use the following steps:
1. Create a directory “UPGRADES” on the USB stick.
2. Copy the Stand-by software (part of the one-zip file, e.g. StandbySW_CFT72_88.0.0.0.upg) into this directory.
3. Insert the USB stick into the TV.
4. Start the download application manually (see section “ Manual Software Upgrade”.
5. Select the appropriate file and press the “OK” button to upgrade.

5.9.4 Content and Usage of the One-Zip Software File

Below the content of the One-Zip file is explained, and instructions on how and when to use it.
- **FUS_Q5551_x.x.x.x_commercial.zip.** Contains the “autorun.upg” which is needed to upgrade the TV main software and the software download application.
- **StandbySW_CFTxx_x.x.x.x_commercial.zip.** Contains the Stand-by software in “upg” and “hex” format.
  - The “StandbySW_xxxxx_prod.upg” file can be used to upgrade the Stand-by software via USB.
  - The “StandbySW_xxxxx.hex” file can be used to upgrade the Stand-by software via ComPair.
  - The files “StandbySW_xxxxx_exhex.hex” and “StandbySW_xxxxx_dev.upg” may not be used by Service technicians (only for development purposes).
- **UpgradeAll_Q555X_x.x.x.x_commercial.zip.** Only for production purposes, not to be used by Service technicians.
- **ProcessNVM_Q55XX_x.x.x.x.zip.** Default NVM content. Must be programmed via ComPair or can be loaded via USB, be aware that all alignments stored in NVM are overwritten here.

5.9.5 UART logging 2K10 (see section “5.8 Fault Finding and Repair Tips, 5.8.6 Logging)

6. Alignments

Index of this chapter:

6.1 General Alignment Conditions
6.2 Hardware Alignments
6.3 Software Alignments
6.4 Option Settings
6.5 Reset of Repaired SSB
6.6 Service SSB delivered without main software loaded
6.7 Total Overview SAM modes

6.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage (depends on region):
  - **AP-NTSC:** 120 VAC or 230 V_{AC} / 50 Hz (± 10%).
  - **AP-PAL-multi:** 120 - 230 V_{AC} / 50 Hz (± 10%).
  - **EU:** 230 V_{AC} / 50 Hz (± 10%).
  - **LATAM-NTSC:** 120 - 230 V_{AC} / 50 Hz (± 10%).
  - **US:** 120 V_{AC} / 60 Hz (± 10%).
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 15 minutes.
- Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO_GND).
  Caution: It is not allowed to use heat sinks as ground.
- Test probe: Ri > 10 MΩ, Ci < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

6.1.1 Alignment Sequence

- First, set the correct options:
  - In SAM, select “Option numbers”.
  - Fill in the option settings for “Group 1” and “Group 2” according to the set sticker (see also paragraph 6.4 Option Settings).
  - Press OK on the remote control before the cursor is moved to the left.
  - In submenu “Option numbers” select “Store” and press OK on the RC.
- OR:
  - In main menu, select “Store” again and press OK on the RC.
  - Switch the set to Stand-by.
- Warming up (>15 minutes).

6.2 Hardware Alignments

Not applicable.

6.3 Software Alignments

Put the set in SAM mode (see Chapter 5. Service Modes, Error Codes, and Fault Finding). The SAM menu will now appear on the screen. Select ALIGNMENTS and go to one of the sub menus. The alignments are explained below.
The following items can be aligned:

- White point
- Ambilight
- TCON Alignment
- Reset TCON Alignment.

To store the data:

- Press OK on the RC **before the cursor is moved to the left**
- In main menu select “Store” and press OK on the RC
- Switch the set to stand-by mode.

For the next alignments, supply the following test signals via a video generator to the RF input:

- **EU/AP-PAL models:** a PAL B/G TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz
- **US/AP-NTSC models:** an NTSC M/N TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).
- **LATAM models:** an NTSC M TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).

6.3.1 White Point

- Choose “TV menu”, “Setup”, “More TV Settings” and then “Picture” and set picture settings as follows:

Picture Setting	
Contrast	100
Brightness	50
Colour	0
Light Sensor	Off
Picture format	Unscaled

- In menu “Picture”, choose “Pixel Plus HD” and set picture settings as follows:

Picture Setting	
Dynamic Contrast	Off
Dynamic Backlight	Off
Colour Enhancement	Off
Gamma	0

- Go to the SAM and select “Alignments”-> “White point”.

White point alignment LCD screens:

- Use a 90% white screen to the HDMI input and set the following values:
  - “Colour temperature”: “Normal”.
  - All “White point” values to: “127”.

In case you have a colour analyser:

- Measure with a calibrated contactless colour analyser (Minolta CA-210 or Minolta CS-200) in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x, y coordinates (while holding one of the White point registers R, G or B on 127) by means of decreasing the value of one or two other white points to the correct x, y coordinates (see Table 6-1 White D alignment values CCFL backlight panels, 6-2 White D alignment values LED backlight panels - colour analyser Minolta CA-210 or 6-3 White D alignment values LED backlight panels - colour analyser Minolta CS-200). Tolerance: dx: ± 0.002, dy: ± 0.002.
- Repeat this step for the other colour temperatures that need to be aligned.
- When finished press OK on the RC and then press STORE (in the SAM root menu) to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

Table 6-1 White D alignment values CCFL backlight panels

Value	Cool (11000K)	Normal (9000K)	Warm (6500K)
x	0.276	0.287	0.313
y	0.282	0.296	0.329

Table 6-2 White D alignment values LED backlight panels - colour analyser Minolta CA-210

Value	Cool (9420K)	Normal (8120K)	Warm (6080K)
x	0.282	0.292	0.320
y	0.298	0.311	0.345

Table 6-3 White D alignment values LED backlight panels - colour analyser Minolta CS-200

Value	Cool (11000K)	Normal (9000K)	Warm (6500K)
x	0.276	0.287	0.313
y	0.282	0.296	0.329

If you do not have a colour analyser, you can use the default values. This is the next best solution. The default values are average values coming from production.

- Select a COLOUR TEMPERATURE (e.g. COOL, NORMAL, or WARM).
- Set the RED, GREEN and BLUE default values according to the values in Table 6-4 and Table 6-5.
- When finished press OK on the RC, then press STORE (in the SAM root menu) to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

Table 6-4 White tone default setting 42" [1]

White Tone				Black level offset	
Colour Temp	R	G	B	R	G
Normal	127	100	66	t.b.d.	t.b.d.
Cool	127	113	118	t.b.d.	t.b.d.
Warm	109	102	127	t.b.d.	t.b.d.

Notes
1): data is preliminary and will be updated in next release.

Table 6-5 White tone default setting 46"

White Tone				Black level offset	
Colour Temp	R	G	B	R	G
Normal	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.
Cool	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.
Warm	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.

Table 6-6 TCON default settings

Screen size	TCON Alignment
42"	443
46"	143

6.3.2 Alignment of the Ambilight modules

Method:

- Go to SAM (press 062596 + OK button).
- Select Alignments.
- Select Ambilight: a white testpattern shall be displayed.
- Select the number of module (pixel) that have to be aligned. Module (pixel) 1 is the first one which will come across according the wire connection track as follows: start by the small signal panel and proceed towards the ambilient modules. This module (pixel) 1 will be connected to the next module (pixel) 2 and etc.
- Align the brightness compared with the neighbour modules. The brightness will be automatically stored.
- Select one of the 10 matrixes which most color respond towards the neighbour modules. The alignment is stored automatically.

6.3.3 TCON Alignment

In TV sets with forward integration where the TCON device is located on the small signal board or 200 Hz board, all TCON values needs realignment for every SSB/display swap due to repair or upgrade. The TCON alignment during assembly is normally supported by a special testpattern and the use of a camera, hence very difficult to simulate for home repair. A more practical way with predefined settings is described below:

- Go to SAM (dial 062596 + OK button pressed).
- Select Alignments.
- TCON alignment: value with 4 digits, this can be changed by RC-transmitter entry according the values listed in Table 6-6. The value shall be stored in:
  - STVM100DC for Sharp
  - MAX9668 for LGD
- Reset TCON alignment: here, a default value (according the display option code) will be copied from the display file to the TCON and changes the current value to the default value.

6.4 Option Settings

6.4.1 Introduction

The microprocessor communicates with a large number of I^2C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence / absence of these PNX51XX ICs (back-end advanced video picture improvement IC which offers motion estimation and compensation features (commercially called HDNM) plus integrated Ambilight control) is made known by the option codes.

Notes:

- After changing the option(s), save them by pressing the OK button on the RC before the cursor is moved to the left, select STORE in the SAM root menu and press OK on the RC.
- The new option setting is only active after the TV is switched “off” / “stand-by” and “on” again with the mains switch (the NVM is then read again).

6.4.2 Dealer Options

For dealer options, in SAM select “Dealer options”.
See Table 6-8 SAM mode overview.

6.4.3 (Service) Options

Select the sub menu's to set the initialisation codes (options) of the model number via text menus.
See Table 6-8 SAM mode overview.

6.4.4 Opt. No. (Option numbers)

Select this sub menu to set all options at once (expressed in two long strings of numbers).
An option number (or “option byte”) represents a number of different options. When you change these numbers directly, you can set all options very quickly. All options are controlled via eight option numbers.
When the NVM is replaced, all options will require resetting. To be certain that the factory settings are reproduced exactly, you must set both option number lines. You can find the correct option numbers on a sticker inside the TV set and in Table 6-7 Option and display code overview.
Example: The options sticker gives the following option numbers:

- 08192 00133 01387 45160
- 12232 04256 00164 00000

The first line (group 1) indicates hardware options 1 to 4, the second line (group 2) indicate software options 5 to 8.
Every 5-digit number represents 16 bits (so the maximum value will be 65536 if all options are set).
When all the correct options are set, the sum of the decimal values of each Option Byte (OB) will give the option number.
See Table 6-7 Option and display code overview for the options.

Diversity
Not all sets with the same Commercial Type Number (CTN) necessarily have the same option code!
Use of Alternative BOM => an alternative BOM number usually indicates the use of an alternative display or power supply. This results in another display code thus in another Option code.
Refer to Chapter 2. Technical Specifications, Diversity, and Connections.

6.4.5 Option Code Overview

Table 6-7 Option and display code overview

CTN (Alt. BOM#)	Options Group 1	Options Group 2	Disp. code
42PFL8605D/93	02060 12803 23359 40647	33552 34310 00000 00000	272
42PFL8605/98	02060 12803 23359 39363	00016 34304 00000 00000	272
46PFL8605D/93	02060 13059 23359 40647	33551 34310 00000 00000	271

Important: after having edited the option numbers as described above, you **must press OK** on the remote control **before the cursor is moved to the left**!

6.5 Reset of Repaired SSB

A very important issue towards a repaired SSB from a Service repair shop (SSB repair on component level) implies the reset of the NVM on the SSB.
A repaired SSB in Service should get the Service Set type “00PF0000000000” and Production code “00000000000000”. Also the virgin bit is to be set. To set all this, you can use the ComPair tool.

After a repaired SSB has been mounted in the set (set repair on board level), the type number (CTN) and production code of the TV has to be set according to the type plate of the set. For this **(new in this platform)**, you can use the NVM editor in SAM. This action also ensures the correct functioning of the “Net TV” feature and access to the Net TV portals. The loading of the CTN and production code can also be done via ComPair (Model number programming).

In case of a display replacement, reset the “Operation hours display” to “0”, or to the operation hours of the replacement display.

6.5.1 SSB identification

Whenever ordering a new SSB, it should be noted that the correct ordering number (12nc) of a SSB is located on a sticker on the SSB. The format is <12nc SSB><serial number>. The ordering number of a “Service” SSB is the same as the ordering number of an initial “factory” SSB.

18310_221_090318.eps
090319

Figure 6-1 SSB identification

6.6 Service SSB delivered without main software loaded

Due to a changed manufacturing process, new **Service SSB’s can be delivered** to the warehouse **without main TV software** loaded. Below you find the steps to follow when such an SSB is received.

6.6.1 When a picture is available

1. Mount the Service SSB into the TV set. After start-up, normally the download application will appear on the screen.
2. Download the latest main software (FUS) from the www.p4c.philips.com website.
3. Create a folder “upgrades” in the root of a USB stick (size > 50 MB) and save the “autorun.upg” file in this “upgrades” folder. **Note:** it is possible to rename this file, e.g. “Q555_SW_version.upg”, this in case there are more than one “autorun.upg” files on your USB stick.
4. Plug the prepared USB stick into the TV set, and select the “autorun” file in the displayed browser on the screen
5. Now the main TV software will be loaded automatically, supported by a progress bar.
6. Set the correct “display code” via “062598-HOME-xxx”, where “xxx” is the 3-digit display panel code (see sticker on the side/bottom of the cabinet).

6.6.2 When no picture is available

Due to a possible wrong display option code in the received Service SSB (NVM), no picture can be available at start-up and thus no download application will be visible. Here you can proceed and finalize step by step to load the main TV software via the UART logging on the PC (for visual feedback).

1. Start-up the TV set, equipped with the Service SSB, and enable the UART logging on the PC (see for settings 5.8 Fault Finding and Repair Tips 5.8.6 Logging).
2. The TV set will start-up automatically in the download application if main TV software is not loaded.
3. Plug the prepared USB stick into the TV set, press cursor “Right” to enter the list, and navigate to the “autorun” file in the UART logging printout via the cursor keys on the remote control. When the correct file is selected, press “OK”.
4. Press cursor “Down” and “OK” to start the flashing of the main TV software. Printouts like: “L: 1-100%, V: 1-100% and P: 1-100%” should be visible now in the UART logging.
5. Wait until the message “Operation successful!” is displayed and remove all inserted media. Restart the TV set

6. Set the correct “display code” via “062598-HOME-xxx”, where “xxx” is the 3-digit display panel code (see sticker on the side/bottom of the cabinet).

6.6.3 Use of repaired SSBs instead of new

Repaired SSBs on stock will obviously already contain main TV software. This implies that only a main software upgrade is required if you use a “repaired” SSB for board swap instead of a “new” SSB.

6.7 Total Overview SAM modes

Table 6-8 SAM mode overview

Main Menu	Sub-menu 1	Sub-menu 2	Sub-menu 3	Description
Hardware Info	A. SW version	e.g. “Q5521_0.33.0.0		Display TV & Standby SW version and CTN serial number
	B. Standby processor version	e.g. “STDBY_42.42.0.0”		
	C. Production code	e.g. “see type plate”		
Operation hours				Displays the accumulated total of operation hours.TV switched “on/off” & every 0.5 hours is increase one
Errors				Displayed the most recent errors
Reset error buffer				Clears all content in the error buffer
Alignment	White point	Colour temperature	Normal	3 different modes of colour temperature can be selected
			Warn	
			Cool	
		White point red		LCD White Point Alignment. For values, see Table 6-4 White tone default setting 42" 1 until 6-5 White tone default setting 46"
		White point green		
		White point blue		
	Ambilight	Select module		
		Brightness		
		Select matrix		
	TCON alignment			used when a new display code (after a SSB exchange) is keyed-in and if you have alignment values from production; see Table 6-6 TCON default settings
	Reset TCON alignment			used when a new display code (after a SSB exchange) is keyed-in and if you do **not** have alignment values from production
Dealer options	Virgin mode	Off/On		Select Virgin mode On/Off. TV starts up / does not start up (once) with a language selection menu after the mains switch is turned “on” for the first time (virgin mode)
	E-sticker	Off/On		Select E-sticker On/Off (USP’s on-screen)
	Auto store mode	None		
		PDC/VPS		
		TXT page		
		PDC/VPS/TXT		

Main Menu	Sub-menu 1	Sub-menu 2	Sub-menu 3	Description
Options	Digital broadcast	DVB	Off/On	Select DVB On/Off
		DVB - T installation	Off/On or Country dependent	Select DVB T installation On/Off or by country
		DVB - T light	Off/On	Select DVB T light On/Off
		DVB - C	Off/On	Select DVB C On/Off
		DVB - C installation	Off/On or Country dependent	Select DVB C installation On/Off or by country
		DVB - C light	Off/On	Select DVB C light On/Off
		DVB - S	Off/On	Select DVB S On/Off
		Over the air download	Off/On or Country dependent	Select Over the air download On/Off or by country
		8 days EPG	Off/On	Select 8 day EPG On/Off
	Digital features	Ethernet	Off/On	Select Ethernet On/Off
		Wi-Fi	Off/On	Select Wi-Fi On/Off
		DLNA	Off/On	Select DLNA On/Off
		On-line service	On	On-line service is On
		Videostore SD card slot	Off/On	Select Videostore SD card slot On/Off
		Multiview	Off/On	Select Multiview On/Off
		Internet software update	Off	Internet software update is Off
	Display	Screen	237 / LCD Sharp D3GA23 46"	Displayed the panel code & type model
		LightGuide	Off/On	Select LightGuide On/Off
		Display fans	Not present/Present	Select Display fans Present/Not present
		Temperature sensor	No sensor/On backside/In display/ On SSB	Sensor present Yes/No and in case Yes, where
		Temperature LUT	0	N.A.
		E-box & monitor	Off/On	Select E-box & monitor On/Off
	Video reproduction	Light sensor	Off/On	Select Light sensor On/Off
		Light sensor type	0/1/2/3	Select Light sensor type form 0 to 3 (for difference styling)
		Super resolution	Off/On	Super resolution Off/On
		Smart bit enhancement	Off/On	Smart bit enhancement Off/On
		Pixel Plus type	Pixel Plus HD	Select type of picture improvement
			Perfect Pixel HD	
			Pixel Precise HD	
		Natural motion type	Perfect Natural Motion	Natural motion type selection
			HD Natural Motion	
		Ambilight	None	Select type of Ambilight modules use
			2 sided 3/3	
			2 sided 4/4	
			2 sided 5/5	
			2 sided 6/6	
			2 sided 7/7	
			3 sided 5/5/5	
			3 sided 6/6/6	
			3 sided 7/7/7	
			3 sided 6/9/6	
		Ambilight sunset	Off/On	Ambilight sunset On/Off
	Audio reproduction	Acoustic system		Cabinet design used for setting dynamic audio parameters
	Source selection	EXT1/AV1 type	SCART CVBS RGB LR	Select input source when connected with external equipment
			CVBS Y/C YPbPr LR	
			CVBS Y/C YPbPr HV LR	
		EXT2/AV2 type	SCART CVBS RGB LR	Select input source when connected with external equipment
			CVBS LR	
			YPbPr LR	
			None	
		EXT3/AV3 type	None	Select input source when connected with external equipment
			CVBS	
			CVBS LR	
			CVBS Y/C LR	
			YPbPr	
			YPbPr LR	
			YPbPr HV LR	
		SIDE I/O	Off/On	Select SIDE I/O On/Off
		S-VIDEO (Y/C)	Off/On	Select S-VIDEO (Y/C) On/Off
		HDMI 2	Off/On	Select HDMI 2 On/Off
		HDMI 3	Off/On	Select HDMI 3 On/Off
		HDMI side	Off/On	Select HDMI side On/Off
		HDMI CEC Viewport 21:9	Off/On	Select HDMI CEC Viewport 21:9 On/Off
		HDMI CEC OneUX seamless	Off/On	Select HDMI CEC OneUX seamless On/Off
	Miscellaneous	Region	Europe	Select Region/country
			AP-PAL-Multi	
			China	
			Australia	
			Latam	
			Russia	
		Tuner type		Select type of Tuner used
		Hotel mode	Off	Hotel mode is Off

Main Menu	Sub-menu 1	Sub-menu 2	Sub-menu 3	Description
Option numbers	Group 1	e.g. “00008.01793.15421.08192”		The first line (group 1) indicates hardware options 1 to 4
	Group 2	e.g. “44013.34315.00000.00000”		The second line (group 2) indicates software options 5 to 8
	Store			Store after changing
Initialise NVM				N.A.
Store				Select Store in the SAM root menu after making **any** changes
Operation hours display		0003		In case the display must be swapped for repair, you can reset the “”Display operation hours” to “0”. So, this one does keeps up the lifetime of the display itself (mainly to compensate the degeneration behaviour)
Software maintenance	Software events	Display		Display information is for development purposes
		Clear		
		Test reboot		
		Test cold reboot		
		Test application crash		
	Hardware events	Display		Display information is for development purposes
		Clear		
Test setting	Digital info	Centre frequency: 774605208		
		QAM modulation: None		Display information is for development purposes
		Symbol rate:		
		Original network ID: 0		
		Network ID: 0		
		Transport stream ID: 0		
		Service ID: 0		
		Hierarchical modulation: 0		
		Selected video PID: 0		
		Selected main audio PID: 0		
		Selected 2nd audio PID: 0		
	Install start frequency	000		Install start frequency from “0” MHz
	Install end frequency	999		Install end frequency as “999” MHz
	Default install frequency			
	Installation	Digital only		Select Digital only or Digital + Analogue before installation
		Digital + Analogue		
Development file versions	Development 1 file version	Display parameters DISPT6.0.9.8		Display information is for development purposes
		Acoustics parameters ACSTS 0.39.6.16		
		PQ - TV550 1.0.22.1		
		PQS- Profile set		
		PQF - Fixed settings		
		PQU - User styles		
		Ambilight parameters PRFAM 5.0.2.4		
	Development 2 file version	12NC one zip software		Display information is for development purposes
		Initial main software		
		NVM version Q55x1_0.3.1.0		
		Flash units software		
		Temp com file version none		
Upload to USB	All			To upload several settings from the TV to an USB stick
	Channel list			
	Personal settings			
	Option codes			
	Alignments			
	Identification data			
	History list			
Download from USB	All			To download several settings from the USB stick to the TV
	Channel list			
	Personal settings			
	Option codes			
	Alignments			
	Identification data			
NVM editor	Type number	see type plate		NVM editor; re key-in type number and production code after SSB replacement
	AG code	see type plate		

7. Circuit Descriptions

Index of this chapter:

7.1 Introduction
7.2 Power Architecture
7.3 DC/DC Converters
7.4 Front-End Analogue and DVB-T, DVB-C; ISDB-T reception
7.5 HDMI
7.6 Video and Audio Processing - PNX85500
7.7 Back-End
7.8 Ambilight
7.9 TCON

Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the wiring, block (see chapter 9. Block Diagrams) and circuit diagrams (see chapter 10. Circuit Diagrams and PWB Layouts). Where necessary, you will find a separate drawing for clarification.

7.1 Introduction

The Q552.1A LA chassis is part of the TV550 platform and comes with the following stylings: “Da Vinci” (series xxPFL6xxx) and “Matisse” (series xxPFL8xx). The TV550 platform is the successor of the TV543 platform.

7.1.1 Implementation

Key components of this chassis are:

- PNX85500 System-On-Chip (SOC) TV Processor
- TX31XX Hybrid Tuner (DVB-T/C, analogue)
- SII9x87 HDMI Switch
- TPA312xD2PWP Class D Power Amplifier
- LAN8710 Dual Port Gigabit Ethernet media access controller.

7.1.2 TV550 Architecture Overview

For details about the chassis block diagrams refer to chapter 9. Block Diagrams. An overview of the TV550 architecture can be found in Figure 7-1.

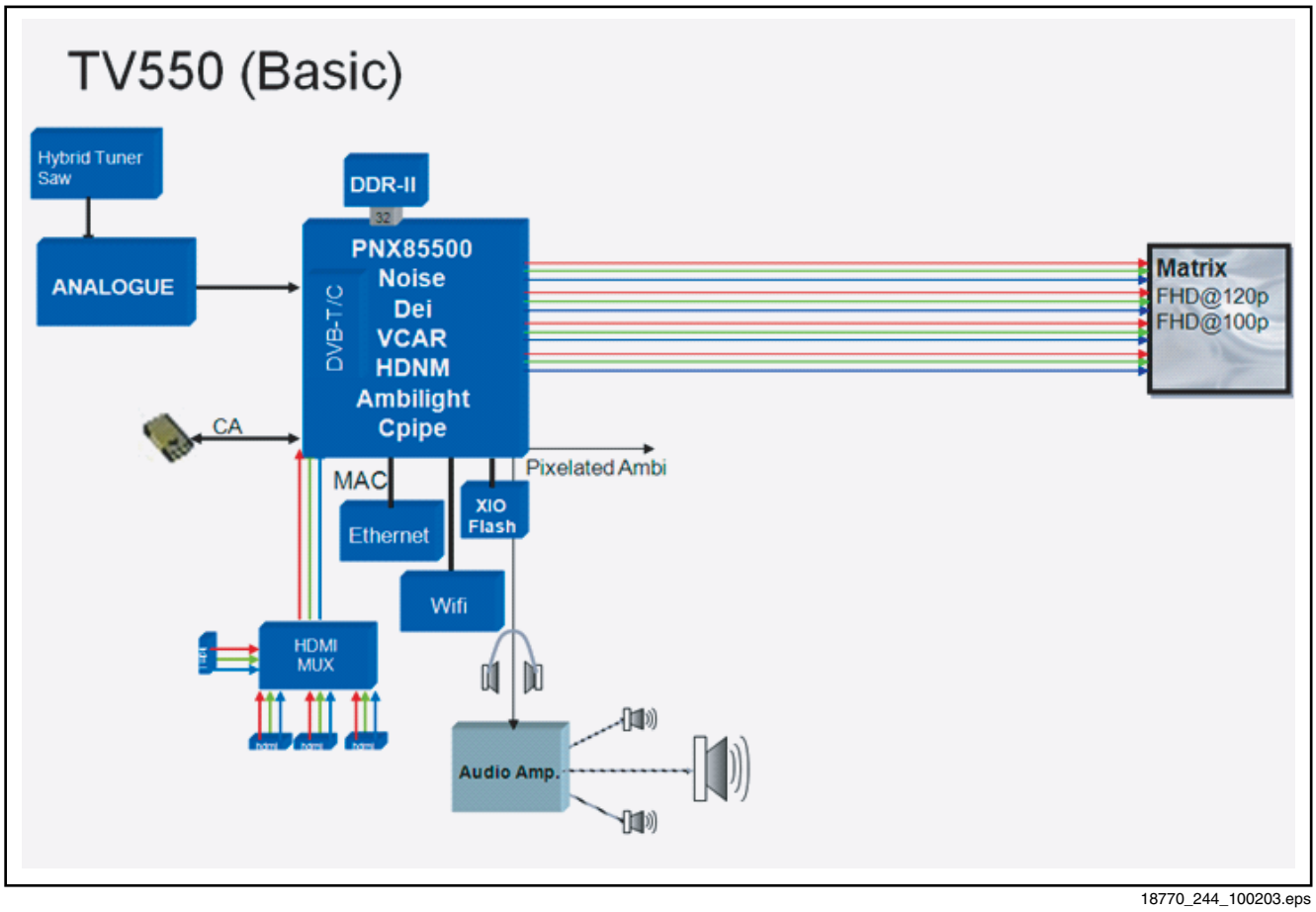


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Figure 7-1 Architecture of TV550 platform - TCON integrated in display (xxPFL8xxx)

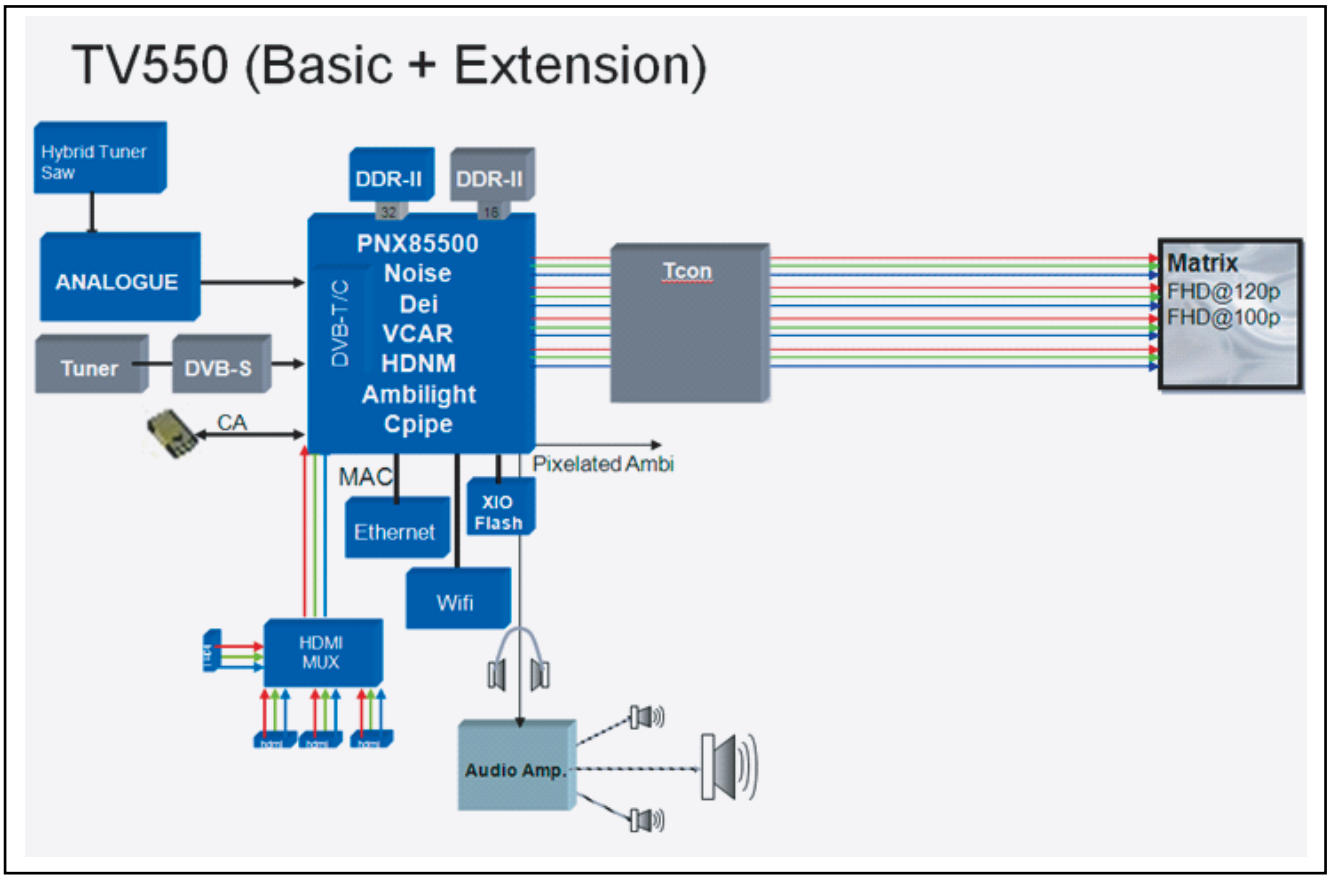

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Figure 7-2 Architecture of TV550 platform - TCON integrated on SSB (xxPFL6xxx)

7.1.3 SSB Cell Layout

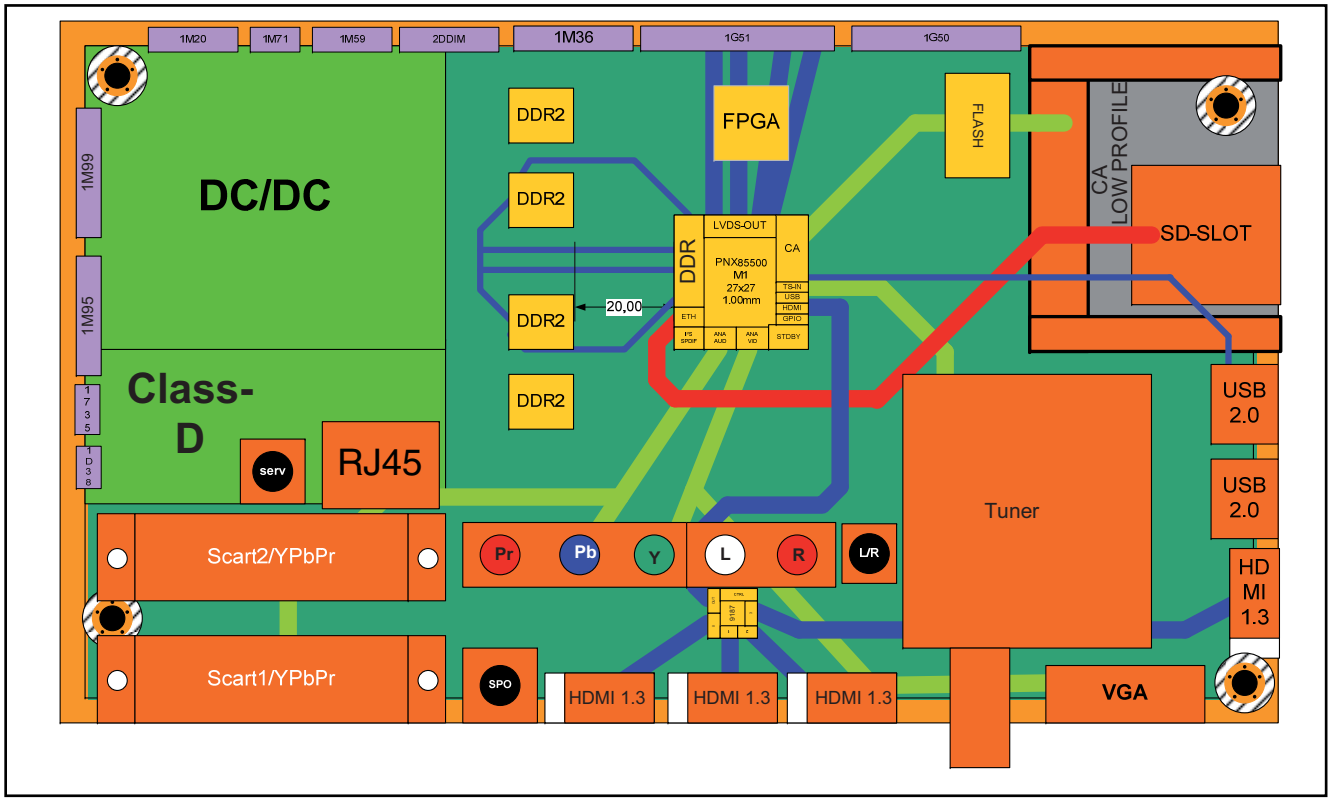

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Figure 7-3 SSB layout cells (top view) TCON integrated in display (xxPFL8xxx)

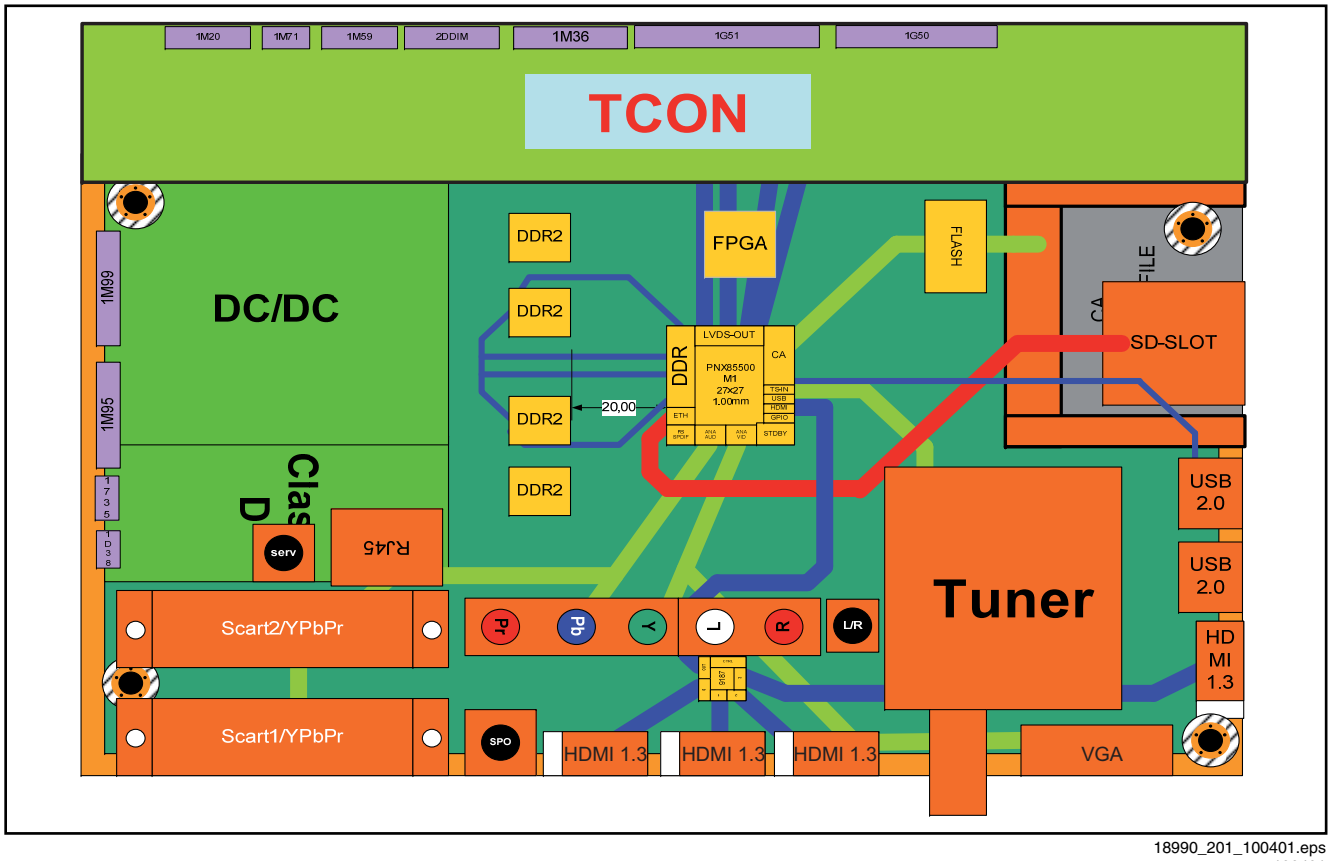

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Figure 7-4 SSB layout cells (top view) TCON integrated on SSB (xxPFL6xxx)

7.2 Power Architecture

Refer to figure Figure 7-5 for the power architecture of this platform.

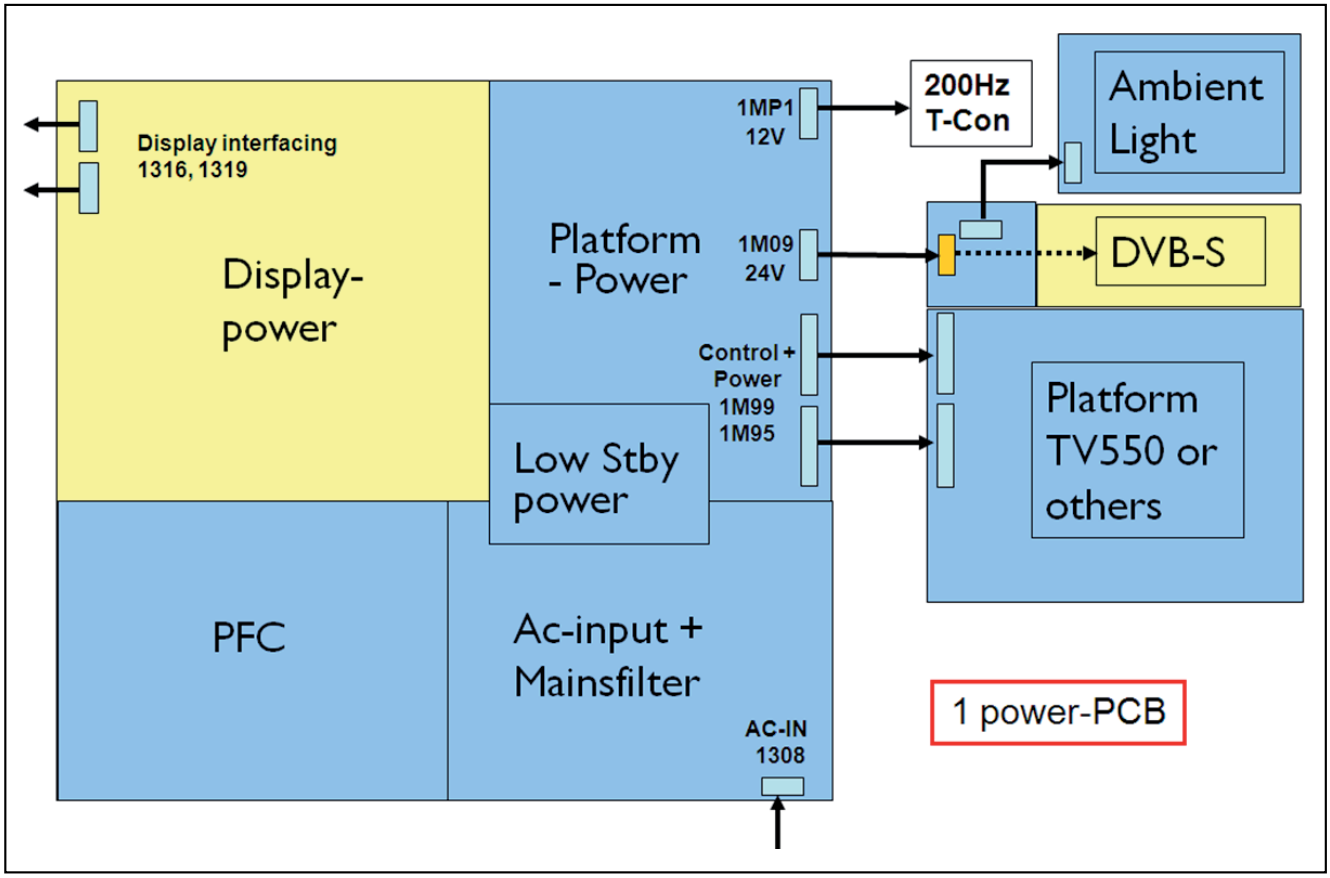

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Figure 7-5 Power Architecture TV550 platform

7.2.1 Power Supply Unit

All power supplies are a black box for Service. When defective, a new board must be ordered and the defective one must be returned, unless the main fuse of the board is broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market. Consult the Philips Service web portal for the order codes of the boards.

Important delta's with the TV543 platform are:
- New power architecture for LED backlight (PSL, PSLS, PSDL)
- "Boost"-signal is now a PWM-signal + continuous variable.

The control signals are:
- Standby
- Lamp "on/off"
- DIM (PWM) (not for PSDL)
- Boost (PWM except for IPB)
- Power-OK: indicates that the main converter is functioning (feedback signal to the SSB).

In this manual, no detailed information is available because of design protection issues.

The output voltages to the chassis are:
- +3V3-STANDBY (standby-mode only)
- +12V (on-mode)
- +Vsnd (+24V) (audio power) (on-mode)
- +24V (bolt-on power) (on-mode)
- Output to the display; in case of
  - IPB: High voltage to the LCD panel
  - PSL and PSLS (LED-driver outputs)
  - PSDL (high frequent) AC-current.

7.2.2 Diversity

The diversity in power supply units is mainly determined by the diversity in displays. Table 7-1 Supply diversity lists the different types of displays with its associated PSUs:

Table 7-1 Supply diversity

CTN	Supplier	PSU
42PFL8605D/93	LGIT	PLDF-P975A
42PFL8605/98	LGIT	PLDJ-P977A
46PFL8605D/93	LGIT	PLDF-P975A

The following displays can be distinguished:
- CCFL/EEFL backlight: power board is conventional IPB
- LED backlight:
  - side-view LED without scanning: PSL power board
  - side-view LED with scanning: PSLS power board
  - direct-view LED without 2D-dimming: PSL power board
  - direct-view LED with 2D-dimming: PSDL power board.

- **PSL** stands for **P**ower **S**upply with integrated **L**ED-drivers.
- **PSLS** stands for a **P**ower **S**upply with integrated **L**ED-drivers with added **S**canning functionality (added microcontroller).

- **PSDL** stands for a **P**ower **S**upply for **D**irect-view **L**ED backlight with 2D-dimming.

7.2.3 Connector overview

Table 7-2 Connector overview

	Connector							
no.	**1308**	**1311**	**1319**	**1316**	**1M95**	**1M99**	**1M09**	**1MP1**
Descr.	**mains**	**mains**	**disp.**	**disp.**	**to SSB**	**to SSB**	**Amb.**	**T-con**
Pin	**CN1**	**CN2**	**CN3**	**CN4**	**CN5**	**CN6**	**CN7**	**CN8**
1	N	L'	t.b.d.	t.b.d.	3V3std	+12V	24Vb	+12V
2	L	L"	t.b.d.	t.b.d.	Stndby	+12V	24Vb	+12V
3	-	-	-	-	GND1	GND1	GND1	n.c.
4	-	-	-	-	GND1	GND1	GND1	GND1
5	-	-	-	-	GND1	BL_ON _OFF	-	GND1
6	-	-	-	-	+12V	DIM	-	-
7	-	-	-	-	+12V	Boost	-	-
8	-	-	-	-	+12V	n.c.	-	-
9	-	-	-	-	+Vsnd	POK	-	-
10	-	-	-	-	GND_ SND	-	-	-
11	-	-	-	-	n.c.	-	-	-
12	-	-	-	-	-	-	-	-

7.3 DC/DC Converters

The on-board DC/DC converters deliver the following voltages (depending on set execution):

- +3V3-STANDBY, permanent voltage for the standby controller, LED/IR receiver and controls; connector 1M95 pin 1
- +12V, input from the power supply for TV550 common (active mode); connector 1M95 pins 6, 7 and 8
- +24V, input from the power supply for DVB-S2 (in active mode); connector 1M09 pins 1 and 2
- +1V1, core voltage supply for PNX85500; has to be started up first and switched "off" last (diagram B03B)
- +1V2, supply voltage for analogue blocks inside PNX85500
- +1V8, supply voltage for DDR2 (diagram B03B)
- +2V5, supply voltage for analogue blocks inside PNX85500 (see diagram B03E)
- +3V3, general supply voltage (diagram B03E)
- +5V, supply voltage for USB and CAM (diagram B03E)
- +5V-TUN, supply voltage for tuner (diagram B03E)
- +V-LNB, input voltage for LNB supply IC (item no. 7T50)
- +5V-DVBS, input intermediate supply voltage for DVB-S2 (diagram B08A)
- +3V3-DVBS, clean voltage for silicon tuner and DVB-S2 channel decoder
- +2V5-DVBS, clean voltage for DVB-S2 channel decoder
- +1V-DVBS, core voltage for DVB-S2 channel decoder.

A +12 V under-voltage detector (see diagram B03C) enables the 12V to 3.3V and 12V to 5V DC/DC converters via the ENABLE-3V3-5V line, and the 12V to 1.8V DC/DC converter via the ENABLE-1V8 line. DETECT2 is the signal going to the standby microcontroller and ENABLE-3V3n is the signal coming from the standby microcontroller.

Diagram B03D contains the following linear stabilisers:

- +2V5 stabiliser, built around item no. 7UCO
- +5V-TUN stabiliser, built around items no. 7UA6 and 7UA7
- +1V2 stabiliser, built around items no. 7UA3 and 7UA4.

Diagram B08A contains the DVB-S2-related DC/DC converters and -stabilisers:

- a +24V under-voltage detection circuitry is built around item no. 7T04
- the switching frequency of the 24 to 14...20V switched mode converter is 350 kHz (item no. 7T03 and +V-LNB lines)
- the output signal on the +V-LNB line goes to the LNBH23Q (item no. 7T50)
- the LNBH23Q (item no. 7T50) sends a feedback signal via the V0-CNTRL line
- the switching frequency of the +5V-DVBS to +1-DVBS switched mode converter is 900 kHz (item no. 7T00)
- a delay line for the +2V5-DVBS and +1V-DVBS lines is created with item no. 3T03 (R=10k) and 2T06 (C=100n)
- a 3.3V to 2.5V linear stabiliser is built around item no. 7T01
- a 5V to 3.3V linear stabiliser is built around item no. 7T02.

7.4 Front-End Analogue and DVB-T, DVB-C; ISDB-T reception

7.4.1 European/China region

The Front-End for the European/China region consist of the following key components:

- Hybrid Tuner
- Switchable SAW filter 7/8 MHz (Eur.), or single SAW filter (8 MHz) (China)
- Bandpass filter
- Amplifier
- PNX85500 SoC TV processor with integrated DVB-T and DVB-C channel decoder and analogue demodulator.

Below find a block diagram of the front-end application for this region.

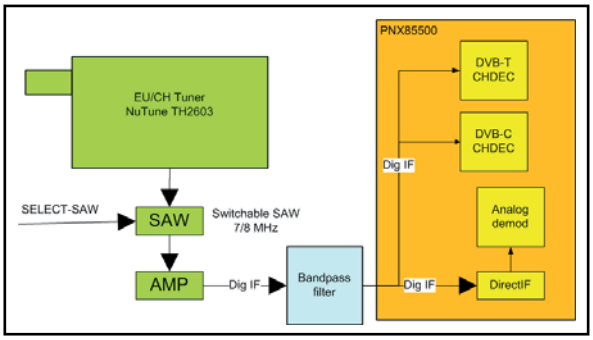

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Figure 7-6 Front-End block diagram European/China region

7.4.2 Brazil region

The Front-End for the Brazil region consist of the following key components:

- Hybrid Tuner with integrated SAW filter and amplifier
- External ISDB-T channel decoder covering the Brazilian digital terrestrial TV standard
- Bandpass filter
- Amplifier
- PNX85500 SoC TV with integrated analogue demodulator.

Below find a block diagram of the front-end application for this region.

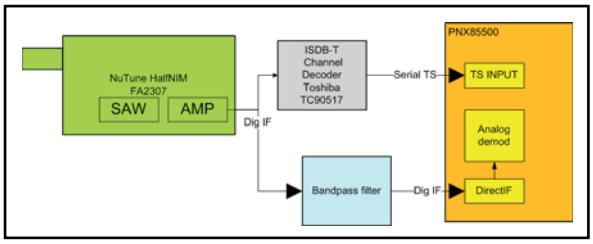

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Figure 7-7 Front-End block diagram Brazil region

7.5 HDMI

In this platform, the Silicon Image Sil9x87 HDMI multiplexer is implemented. Refer to figure 7-8 HDMI input configuration for the application.

New in this platform is the implementation of the Audio Return Channel (ARC) (pin 14 on HDMI 1). The ARC in HDMI1.4 enables a TV, via a single HDMI cable, to send audio data “upstream” to an A/V receiver or surround audio controller, increasing user flexibility and eliminating the need for any separate SPDIF audio connection.

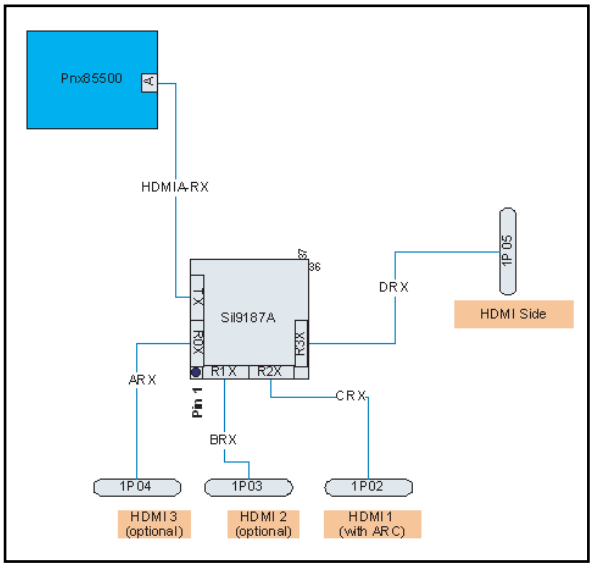

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Figure 7-8 HDMI input configuration

The following multiplexers can be used:
- Sil9187A (does not support “Instaport” technology for fast switching between input signals)
- Sil9287B (supports “Instaport” technology for fast switching between input signals).

The hardware default I^2C addresses are:
- Sil9187A: 0xB0/0xB2 (random: software workaround)
- Sil9287B: 0xB2 (fixed).

The Sil9x87 has the following specifications:
- +5V detection mechanism
- Stable clock detection mechanism
- Integrated EDID
- RT control
- HPD control
- Sync detection
- TMDS output control
- CEC control
- EDID stored in Sil9x87, therefore there are no EDID pins on the SSB.

7.6 Video and Audio Processing - PNX85500

The PNX85500 is the main audio and video processor (or System-on-Chip) for this platform. It has the following features:

- Multi-standard digital video decoder (MPEG-2, H.264, MPEG-4)
- Integrated DVB-T/DVB-C channel decoder
- Integrated CI+
- Integrated motion accurate picture processing (MAPP2)
- High definition ME/MC
- 2D LED backlight dimming option
- Embedded HDMI HDCP keys
- Extended colour gamut and colour booster
- Integrated USB2.0 host controller
- Improved MPEG artefact reduction compared with PNX8543
- Security for customers own code/settings (secure flash).

The TV550 combines front-end video processing functions, such as DVB-T channel decoding, MPEG-2/H.264 decode, analogue video decode and HDMI reception, with advanced back-end video picture improvements. It also includes next generation Motion Accurate Picture Processing (MAPP2). The MAPP2 technology provides state-of-the-art motion artifact reduction with movie judder cancellation, motion sharpness and vivid colour management. High flat panel screen resolutions and refresh rates are supported with formats including 1366 × 768 @ 100Hz/120Hz and 1920 × 1080 @ 100Hz/120Hz. The combination of Ethernet, CI+ and H.264 supports new TV experiences with IPTV and VOD. On top of that, optional support is available for 2D dimming in combination with LED backlights for optimum contrast and power savings up to 50%.

For a functional diagram of the PNX85500, refer to Figure 7-9.

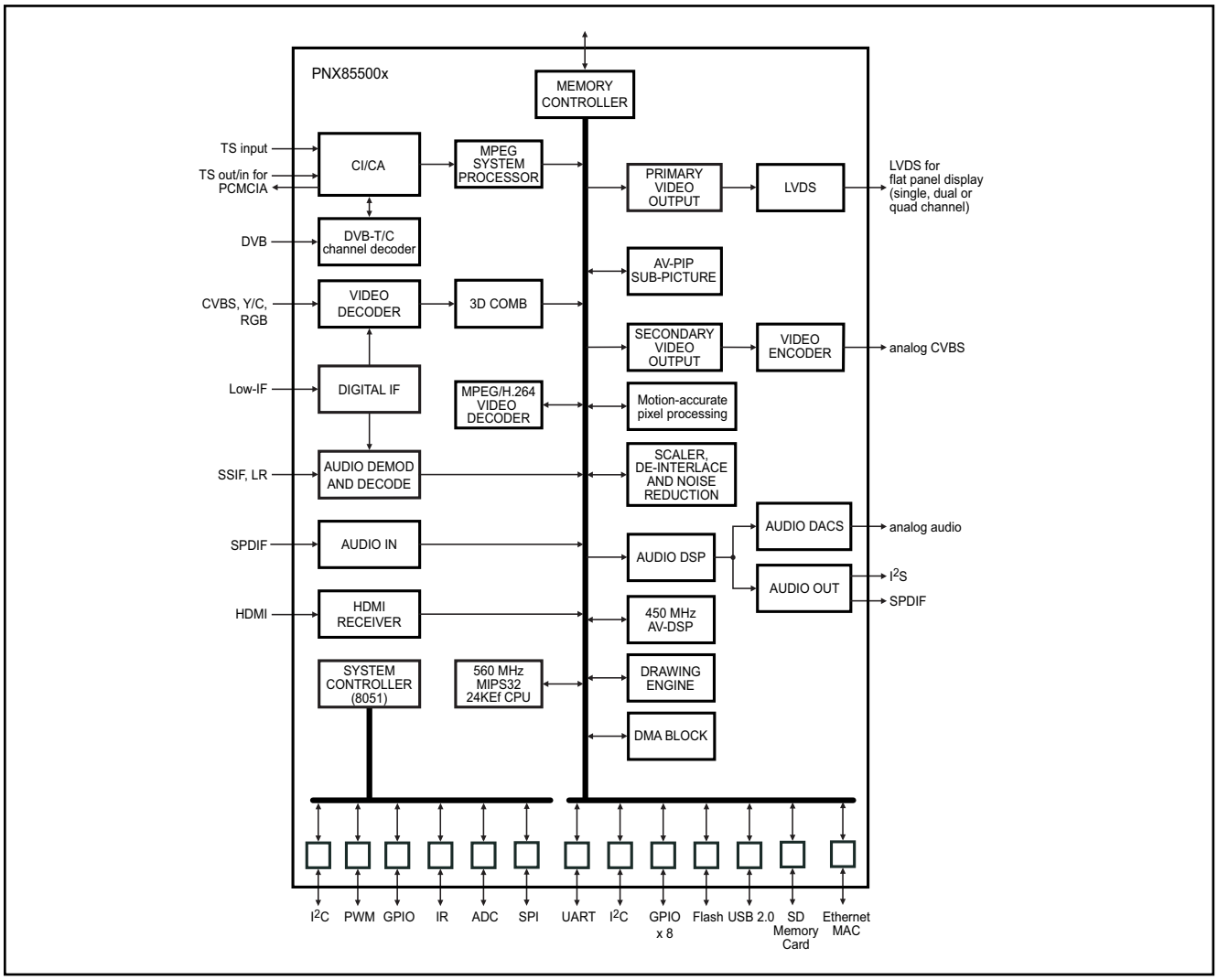

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Figure 7-9 PNX85500 functional diagram

7.7 Back-End

The following backlight types can be distinguished:

- CCFL/EEFL backlight; applicable to the xxPFL54xx sets
- LED backlight:
  - side-view (edge) LED without scanning: PSL power board; applicable to xxPFL76xx sets
  - side-view (edge) LED with scanning: PSLS power board; not applicable to this chassis
  - direct-view LED with 0D-dimming: PSL power board; applicable to xxPFL56xx sets
  - direct-view LED with 2D-dimming: PSDL power board; not applicable to this chassis.

Refer to section 7.2.2 Diversity for an in-depth explanation of the different power boards that are used.

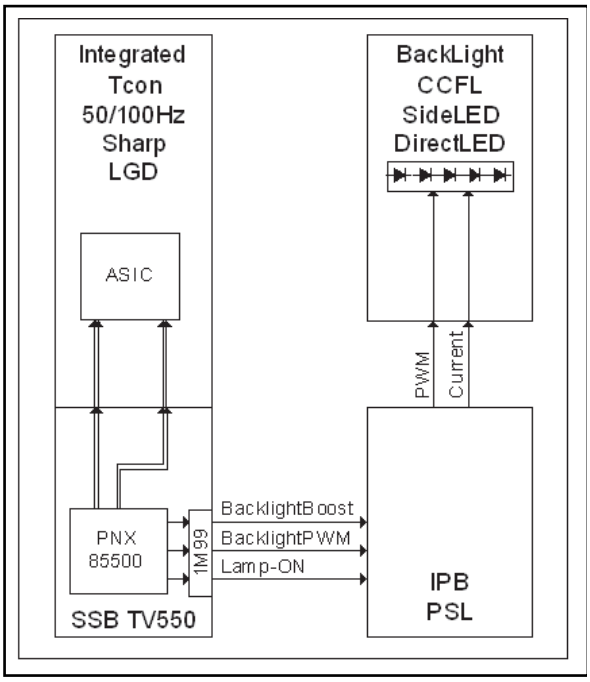

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Figure 7-10 Backlight (xxPFL54xx, xxPFL56xx, xxPFL76xx sets) application

7.8 Ambilight

In this chassis, only 2-sided Ambilight is implemented. Refer to figure 7-11 Ambilight architecture.

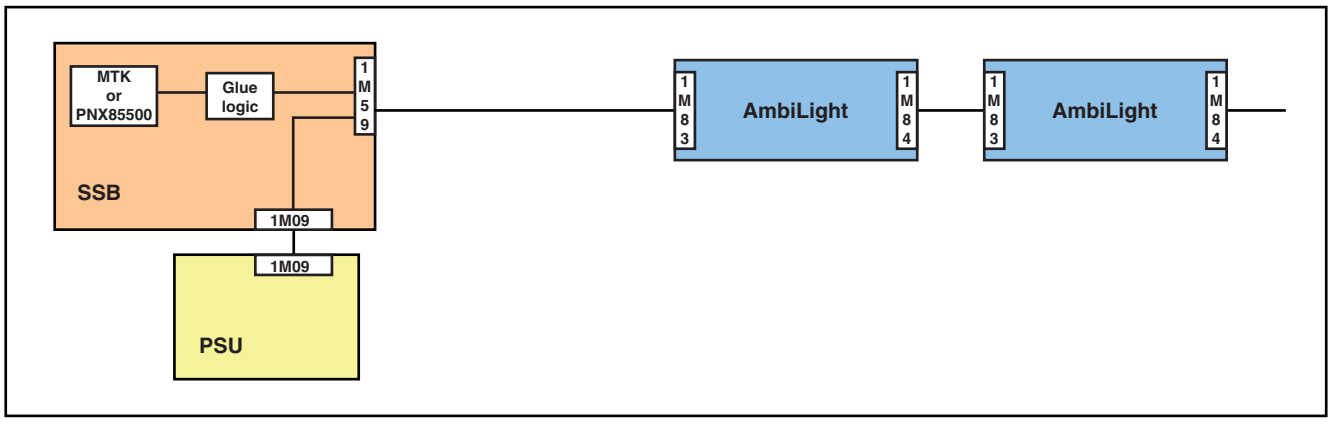

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Figure 7-11 Ambilight architecture

For an overview of the LED grouping per board, refer to figure 7-12 LED grouping per board.

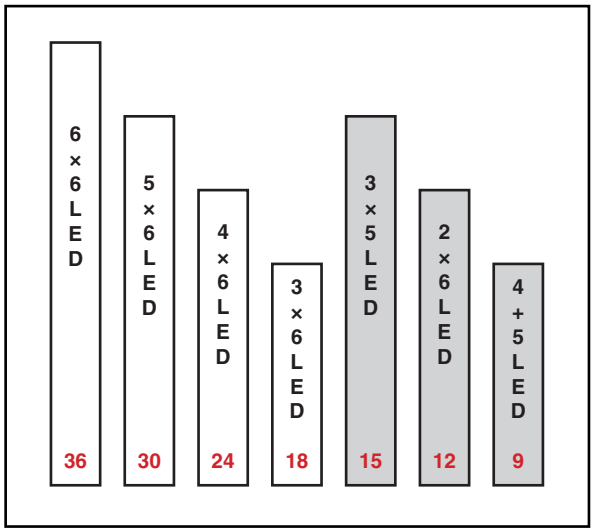

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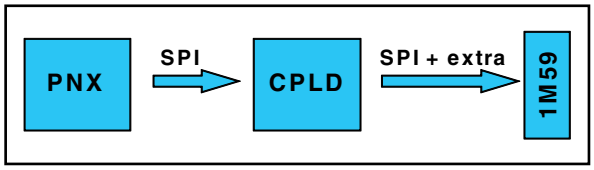
Figure 7-12 LED grouping per board

The communication between PNX85500, Complex Programmable Logic Device (CPLD) and the Ambilight module uses the SPI protocol; refer to figure 7-13 Communication protocol outside LED board. Between the CPLD and the LED driver, as “extra” line is mentioned:

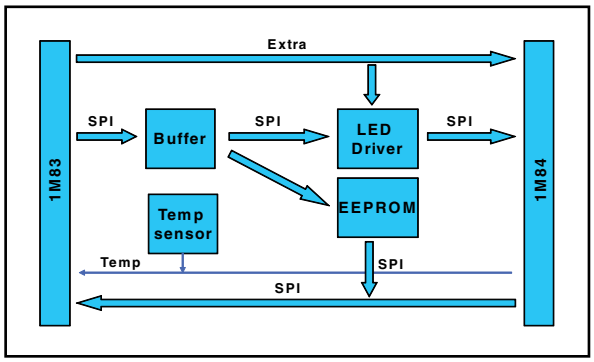
- Non-SPI signals that are required for the LED driver
- Temperature sensor line.



18770_211_100126.eps
100126

Figure 7-13 Communication protocol outside LED board

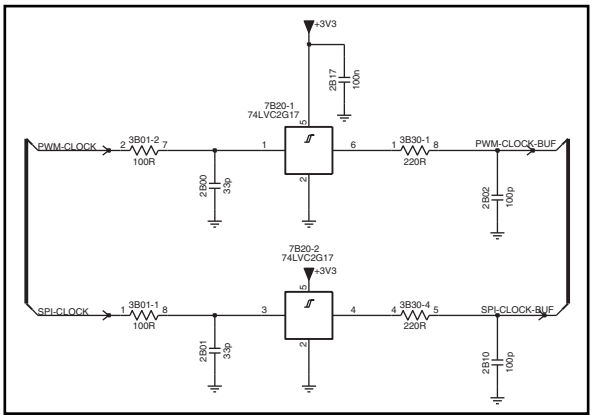
Refer to figure for an overview of the communication inside the LED board.



18770_213_100126.eps
100219

Figure 7-14 Communication protocol inside LED board

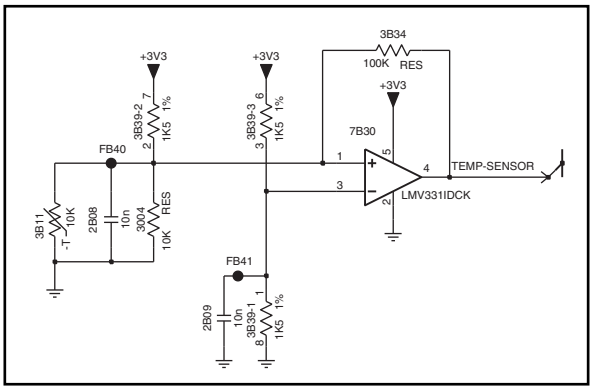
The buffer is built around item no. 7B20 (diagram AL1A) and regenerates the clock signals. Refer to figure 7-15 Ambilight buffer.



18770_214_100126.eps
100126

Figure 7-15 Ambilight buffer

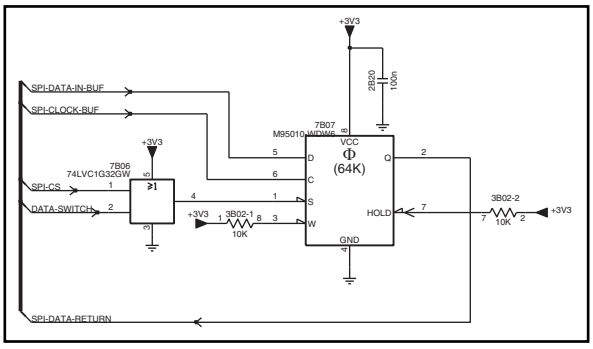
The temperature sensor is built around item no. 7B30 (diagram AL1A) and indicates overtemperature of the board. Refer to figure 7-16 Temperature sensor.



18770_215_100126.eps
100126

Figure 7-16 Temperature sensor

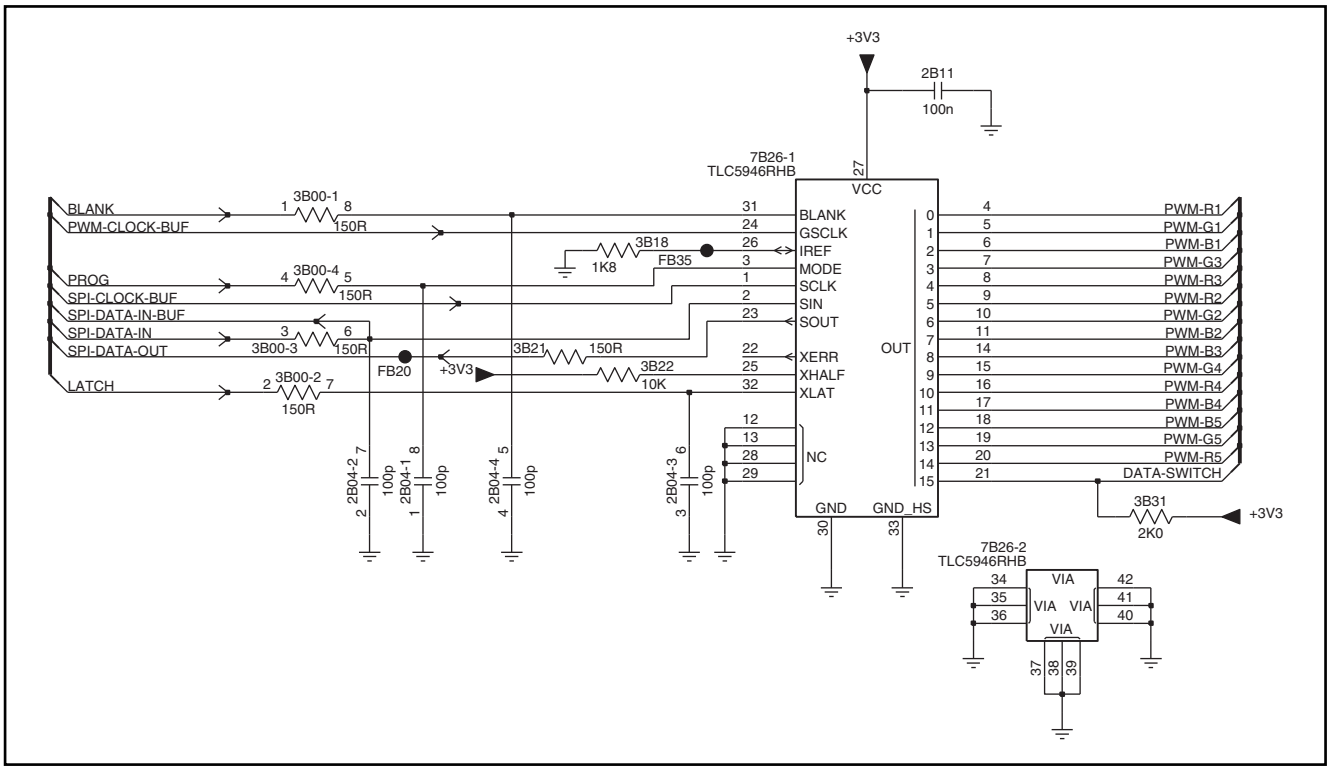
The EEPROM (item no. 7B07; diagram AL1A) contains alignment information about the mounted LEDs and is programmed during the alignment process in production. Refer to figure 7-17 EEPROM.



18770_216_100126.eps
100126

Figure 7-17 EEPROM

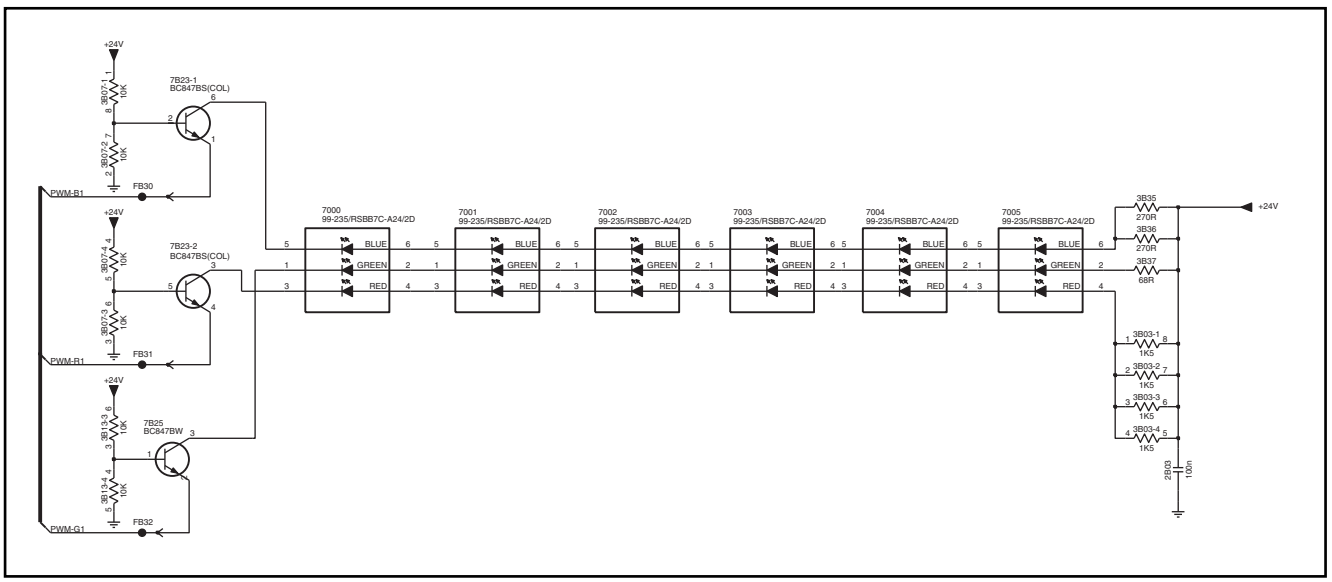
The LED driver is built around item no. 7B26 (diagram AL1A) and controls the LEDs. Refer to figure 7-18 LED driver.



18770_217_100126.eps
100126

Figure 7-18 LED driver

The Overvoltage Protection Circuit is built around item no. 7B50, 7B51, 7C20 and 7C22 (diagram AL1B). Refer to figure 7-19 Overvoltage Protection Circuit.



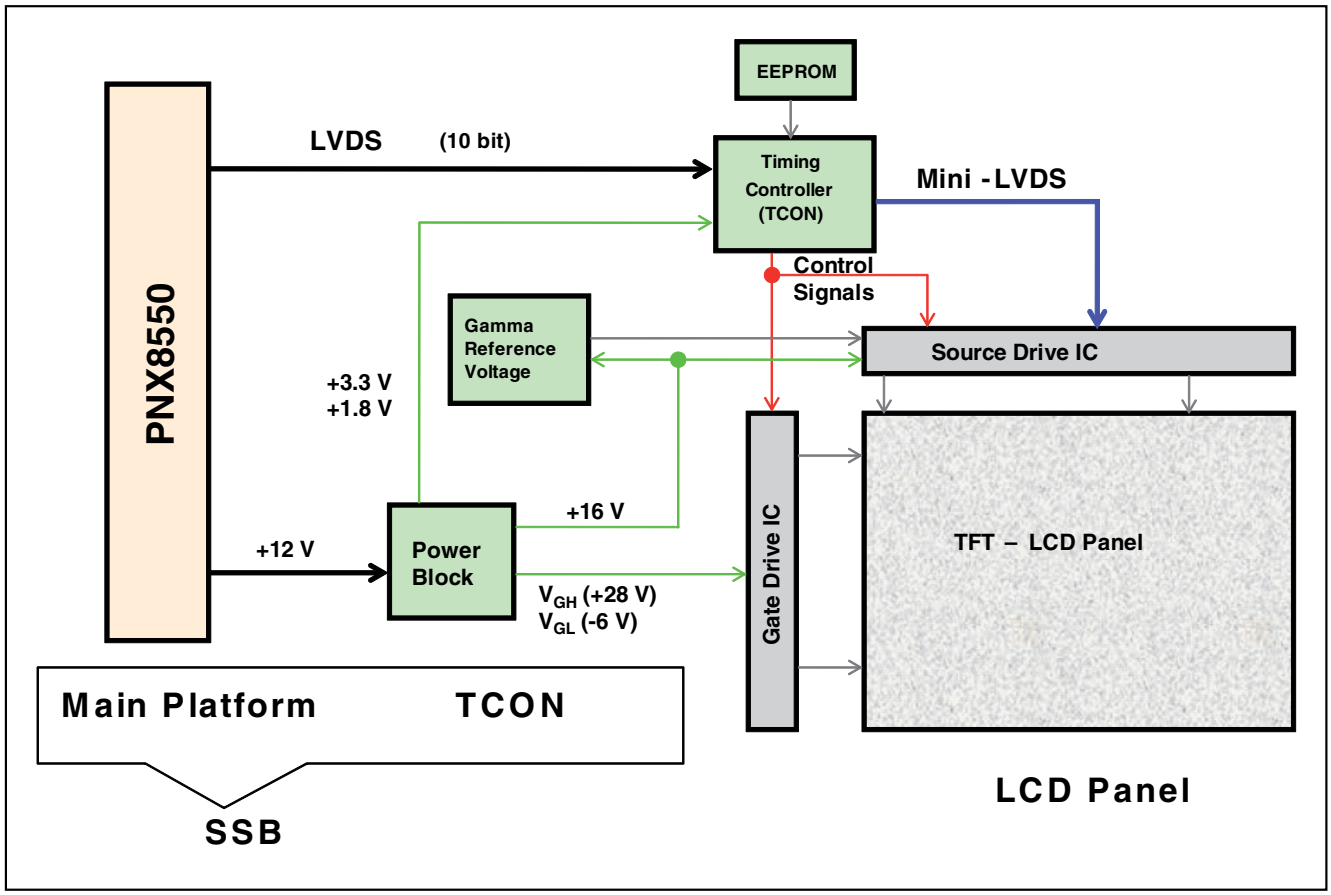
18770_218_100126.eps
100126

Figure 7-19 Overvoltage Protection Circuit

7.9 TCON

This section describes the application with the TCON integrated on the SSB.

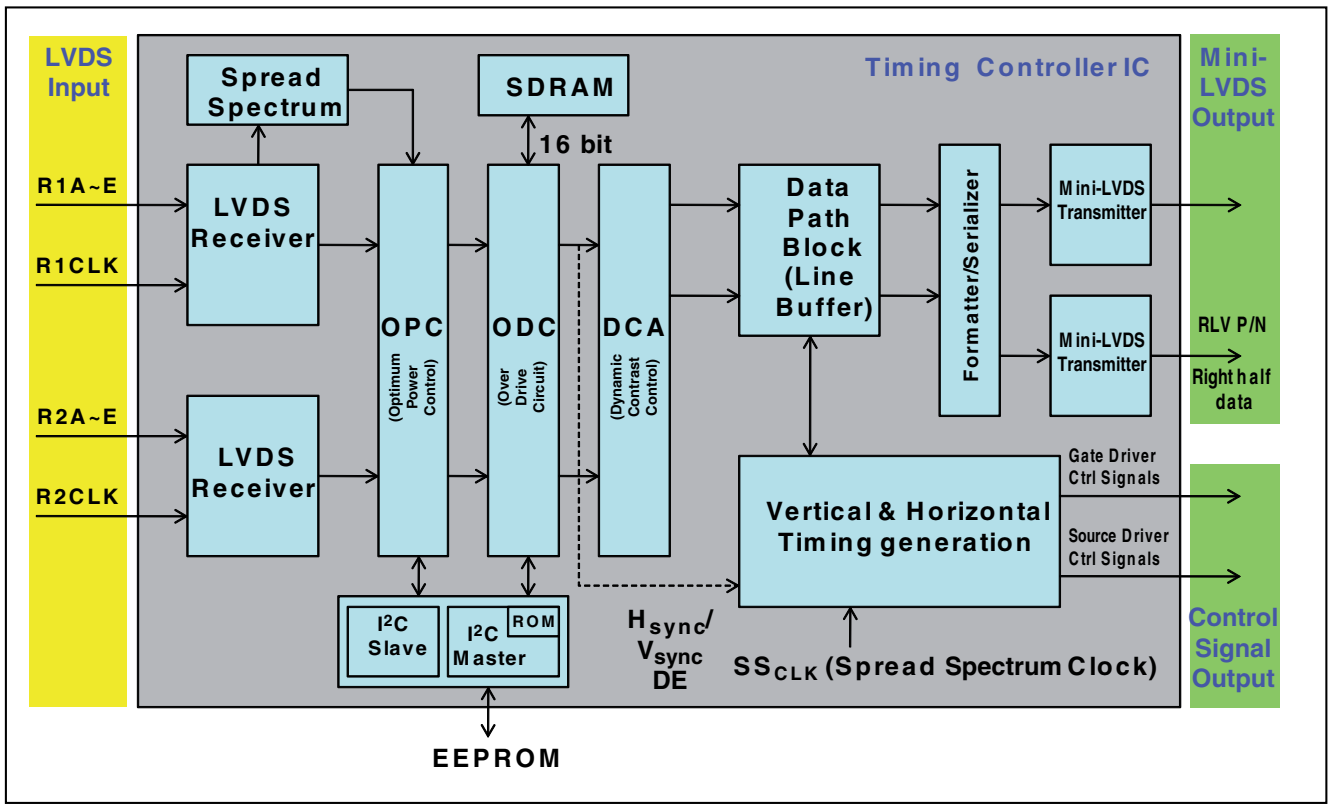
For the basic application, refer to figure 7-20 TCON architecture.



18770_238_100127.eps
100402

Figure 7-20 TCON architecture

For the TCON block diagram, refer to figure 7-21 TCON block diagram.



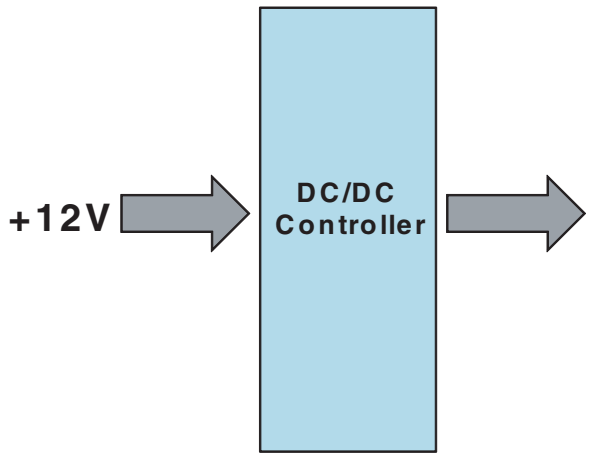
18770_239_100127.eps
100127

Figure 7-21 TCON block diagram

Notes to figure 7-21 TCON block diagram:

- LVDS receiver: converts the data stream back into RGB data and SYNC signals (Vsync, Hsync, Data Enable - DE)
- ODC: Over Drive Circuit - to improve LC response
- Data Path Block: the video RGB data input to data path block is delayed to align the column driver start pulse with the column driver data
- Timing Control Function: generates control signals to column drivers and row drivers (Source Enable - SOE, Gate Enable - GOE, Gate Start Pulse - GSP).

For an overview of the TCON DC/DC converters, refer to figure 7-22 TCON DC/DC converters.



	LGD	SHP	Where Used
VGH	+28V	+35V	To Gate Drivers (Gate High Voltage)
VGL	-6V	-6V	To Gate Drivers (Gate Low Voltage)
Vcc	+3V3	+3V3	Timing Controller IC Supply Voltage
Vcc	+1V8	+1V2	Timing Controller IC Supply Voltage
Vref	+16V	+15V2	Gamma Reference Voltage
Vdd	+16V	+15V6	Source Driver Supply Voltage

18770_240_100128.eps
100128

Figure 7-22 TCON DC/DC converters

7.9.1 TCON Programming

For LGD - TCONs, the EEPROM can be programmed via ComPair (via I^2C communication).
For Sharp - TCONs, the data can be flashed with a “SPI Programmer” (via SPI communication). This device has to be ordered separately via Philips.

7.9.2 TCON Alignment

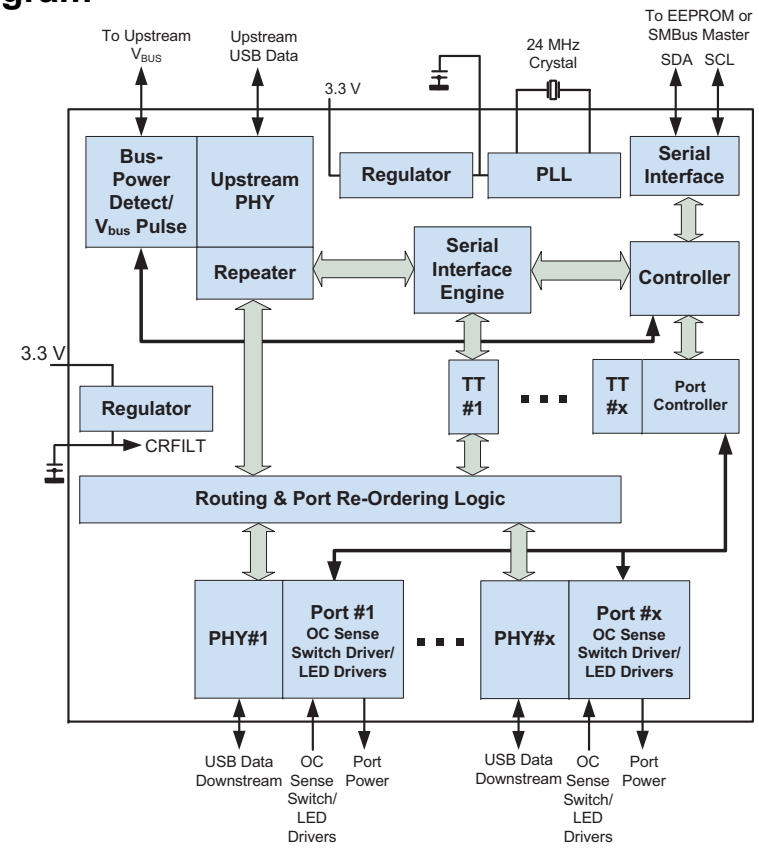
The purpose of TCON alignment is to obtain equal voltages for both positive and negative LC polarity. This is to avoid “flicker” and “image sticking”. For alignment, see 6.3.3 TCON Alignment.

8. IC Data Sheets

This chapter shows the internal block diagrams and pin configurations of ICs that are drawn as “black boxes” in the electrical diagrams (with the exception of “memory” and “logic” ICs).

8.1 Diagram USB Hub B01C, USB2513B (IC 7F25)

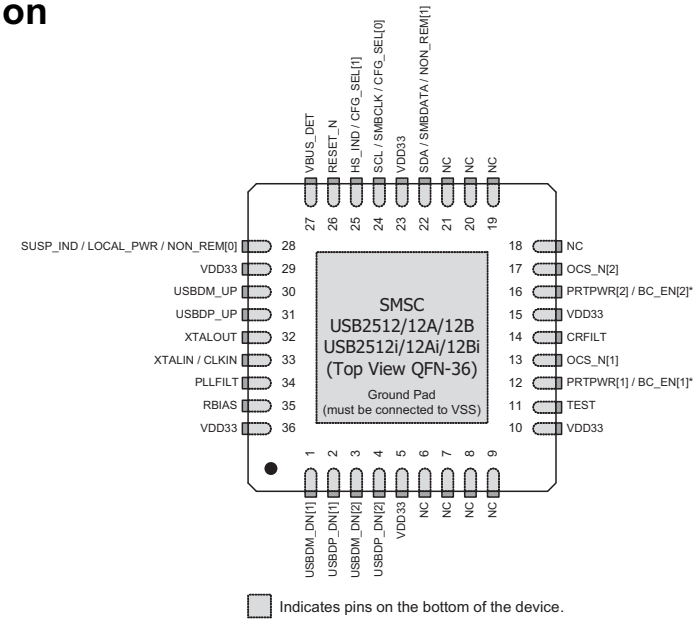
Block diagram



The ‘x’ indicates the number of available downstream ports: 2, 3, 4, or 7.

Note : The LED port indicators only apply to USB2513i.

Pinning information

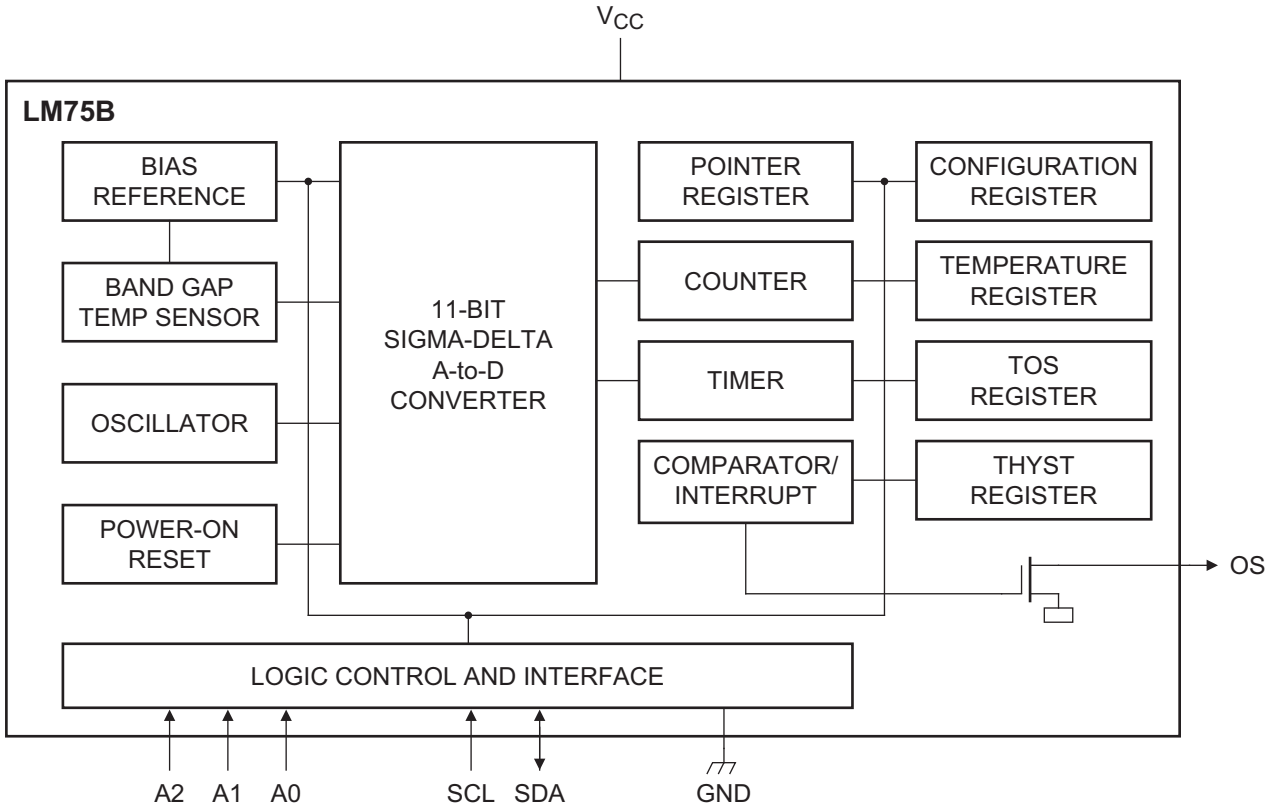


18770_301_100217.eps
100217

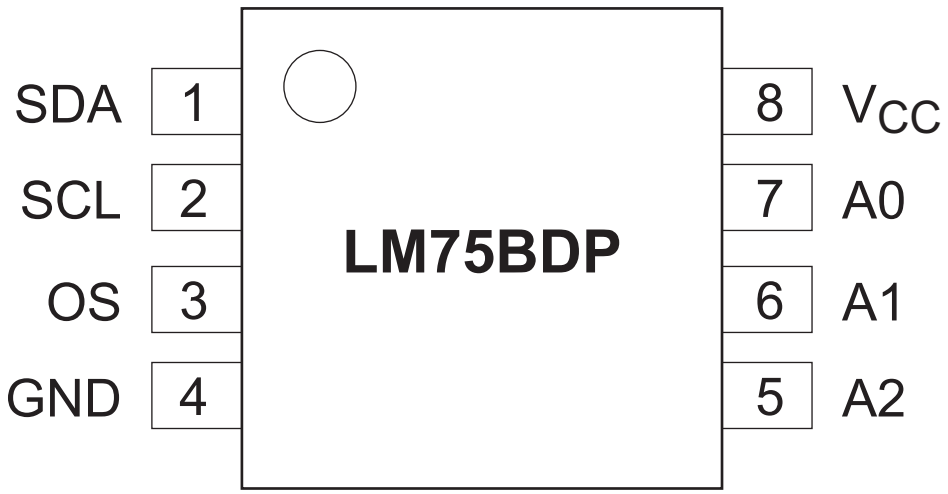
Figure 8-1 Internal block diagram and pin configuration

8.2 Diagram Temp Sensor + Headphone B01J, LM75BDP (IC 7FD1)

Block diagram



Pinning information

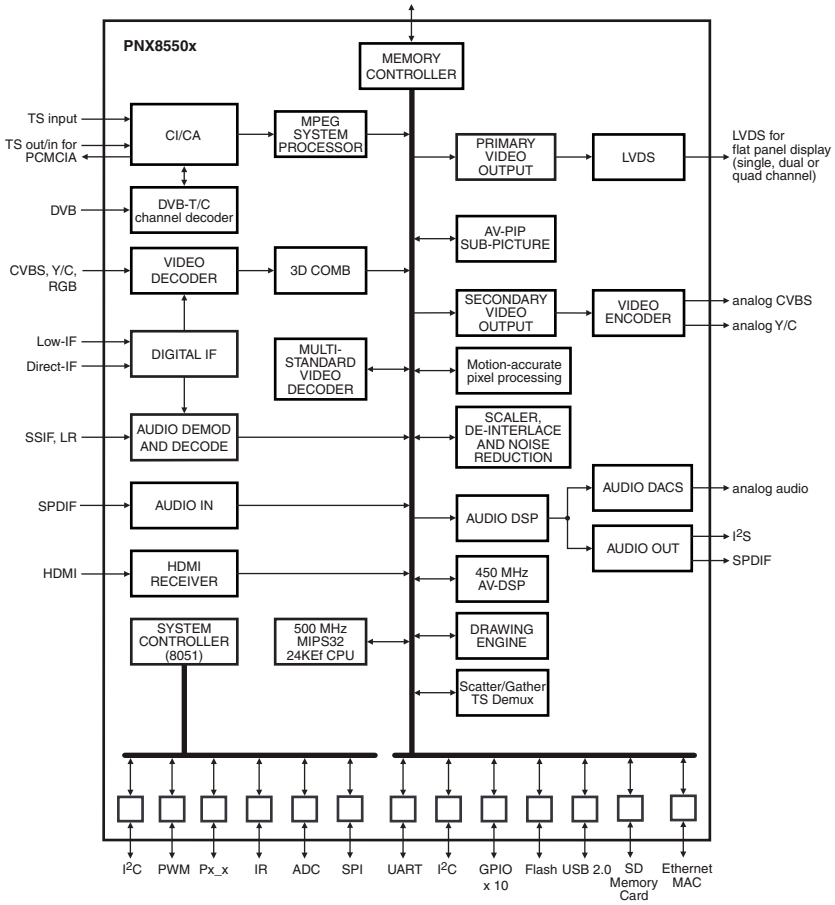


18770_300_100217.eps
100217

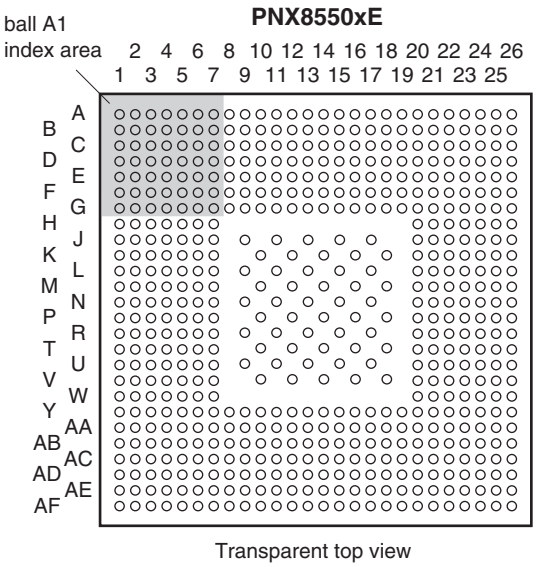
Figure 8-2 Pin configuration

8.3 Diagram PNX NandFlash - Conditional Access B02A, PNX85500 (IC7S00)

Block diagram



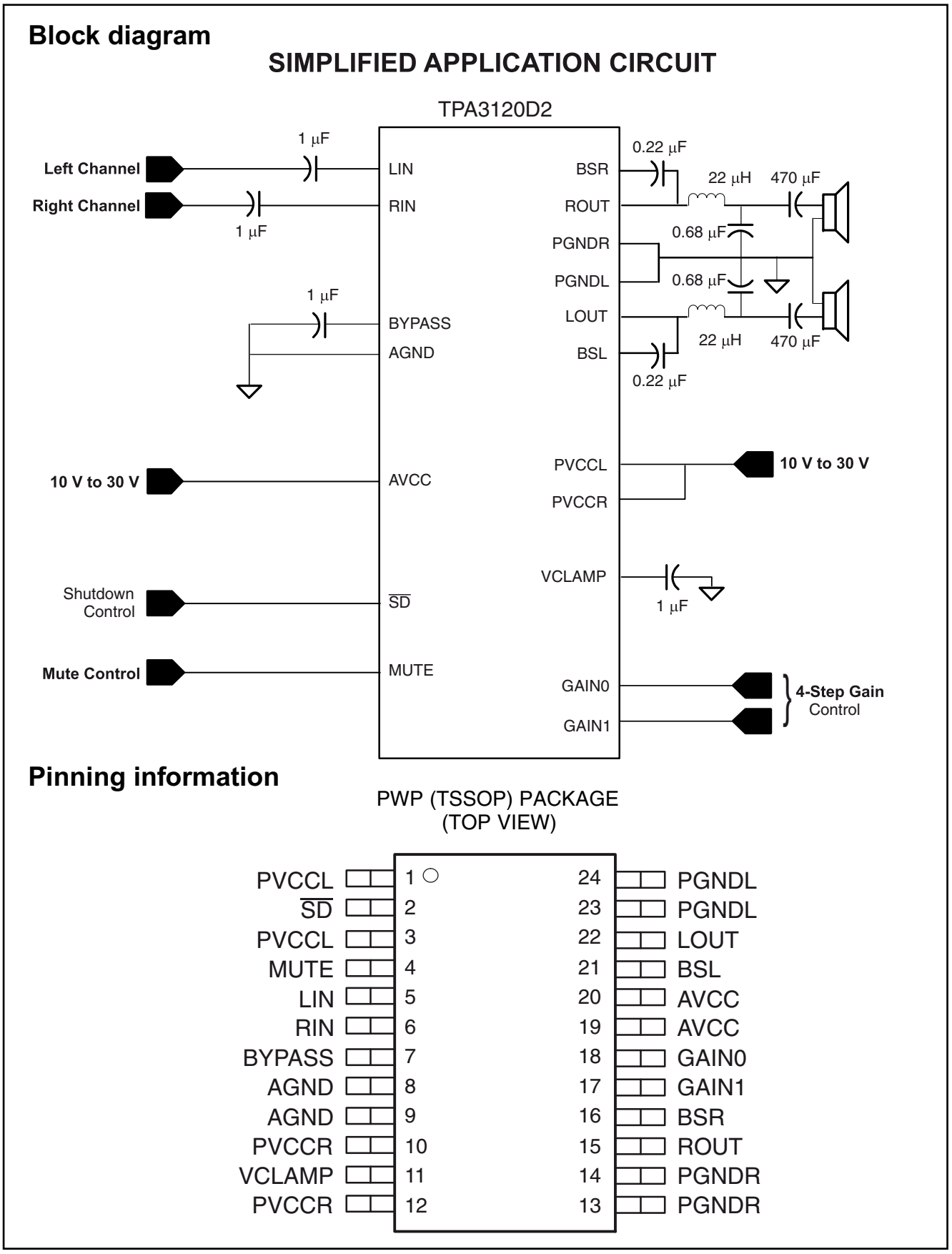
Pinning information


ball A1
index area
PNX8550xE
2 4 6 8 10 12 14 16 18 20 22 24 26
1 3 5 7 9 11 13 15 17 19 21 23 25
A B C D E F G H J K L M N P R T U V W Y AA AB AC AD AE AF
Transparent top view

18770_308_100217.eps
100217

Figure 8-3 Internal block diagram and pin configuration

8.4 Diagram Audio B03A, TPA3120D2PWP (IC7D10)

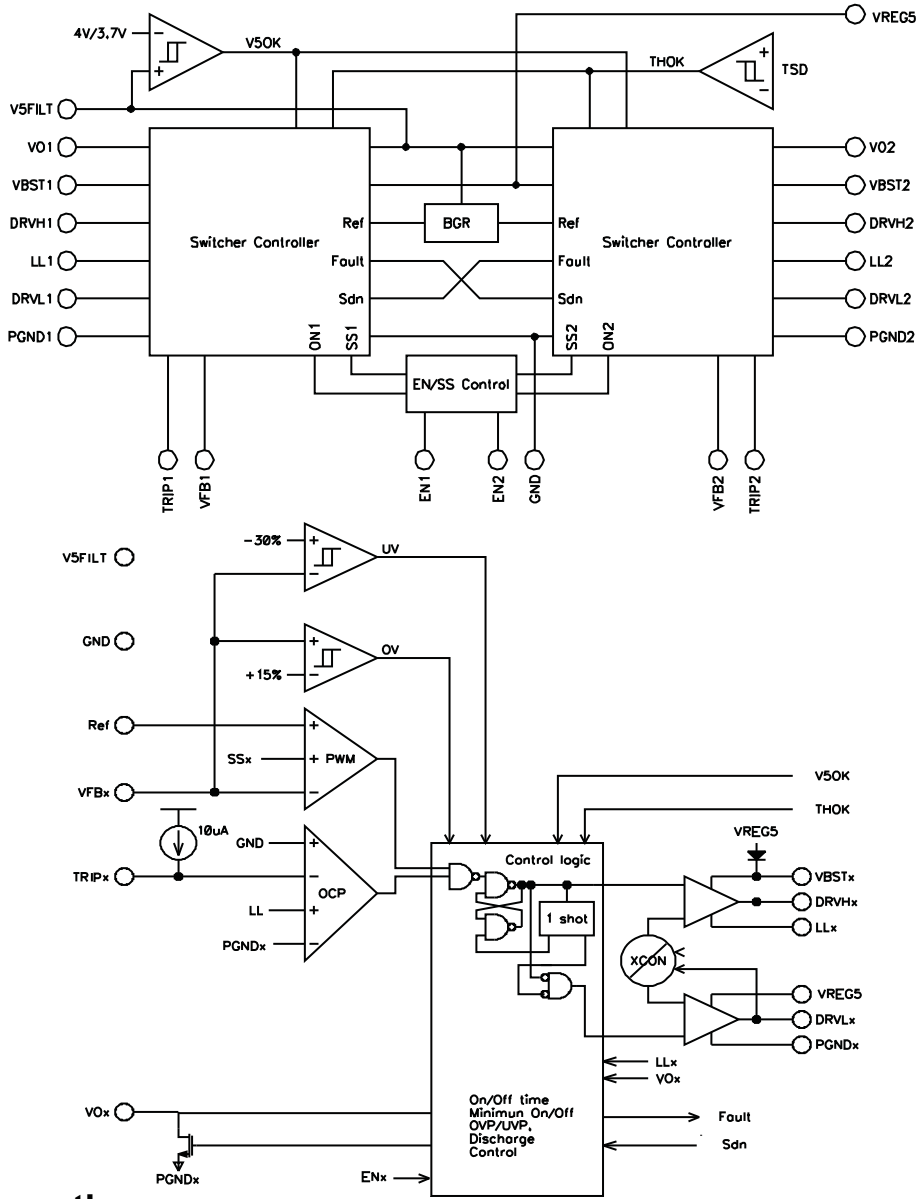


I_18020_142.eps
100402

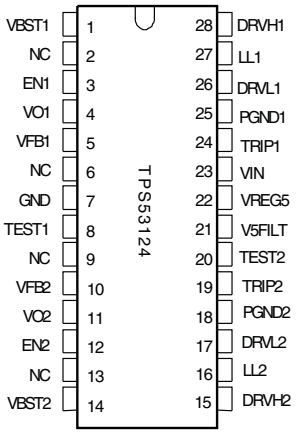
Figure 8-4 Internal block diagram and pin configuration

8.5 Diagram DC/DC B03B, TPS53126PW (IC7U03)

Block diagram



Pinning information

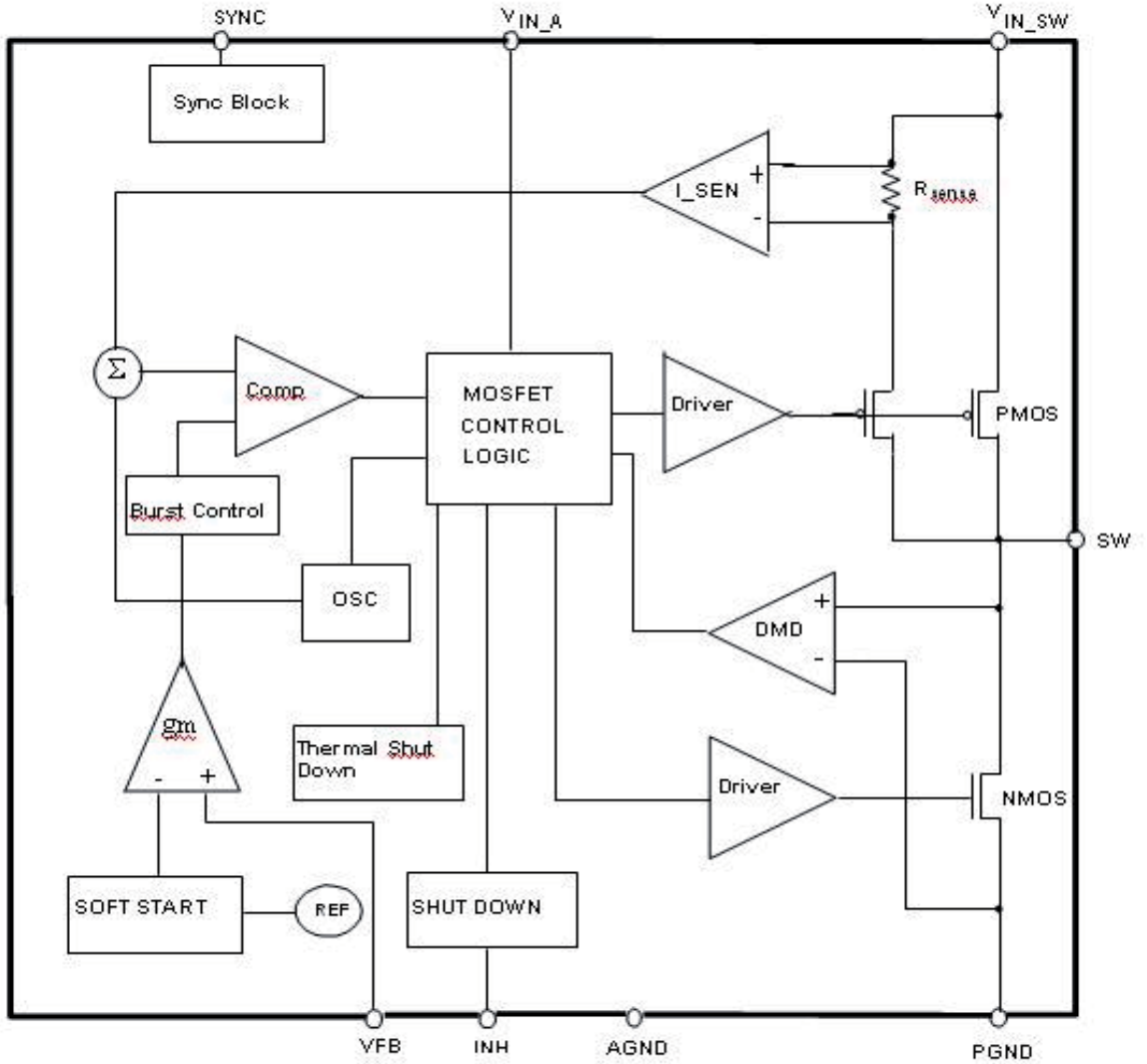


18250_300_090319.eps
100402

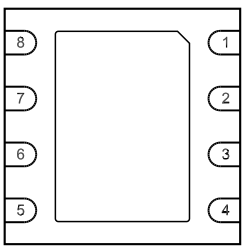
Figure 8-5 Internal block diagram and pin configuration

8.6 Diagram DC/DC B03E, ST1S10PH (IC 7UD0)

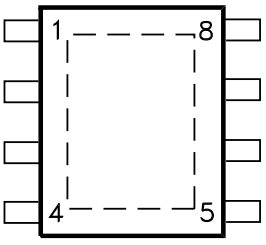
Block diagram



Pinning information



DFN8 (4 × 4)

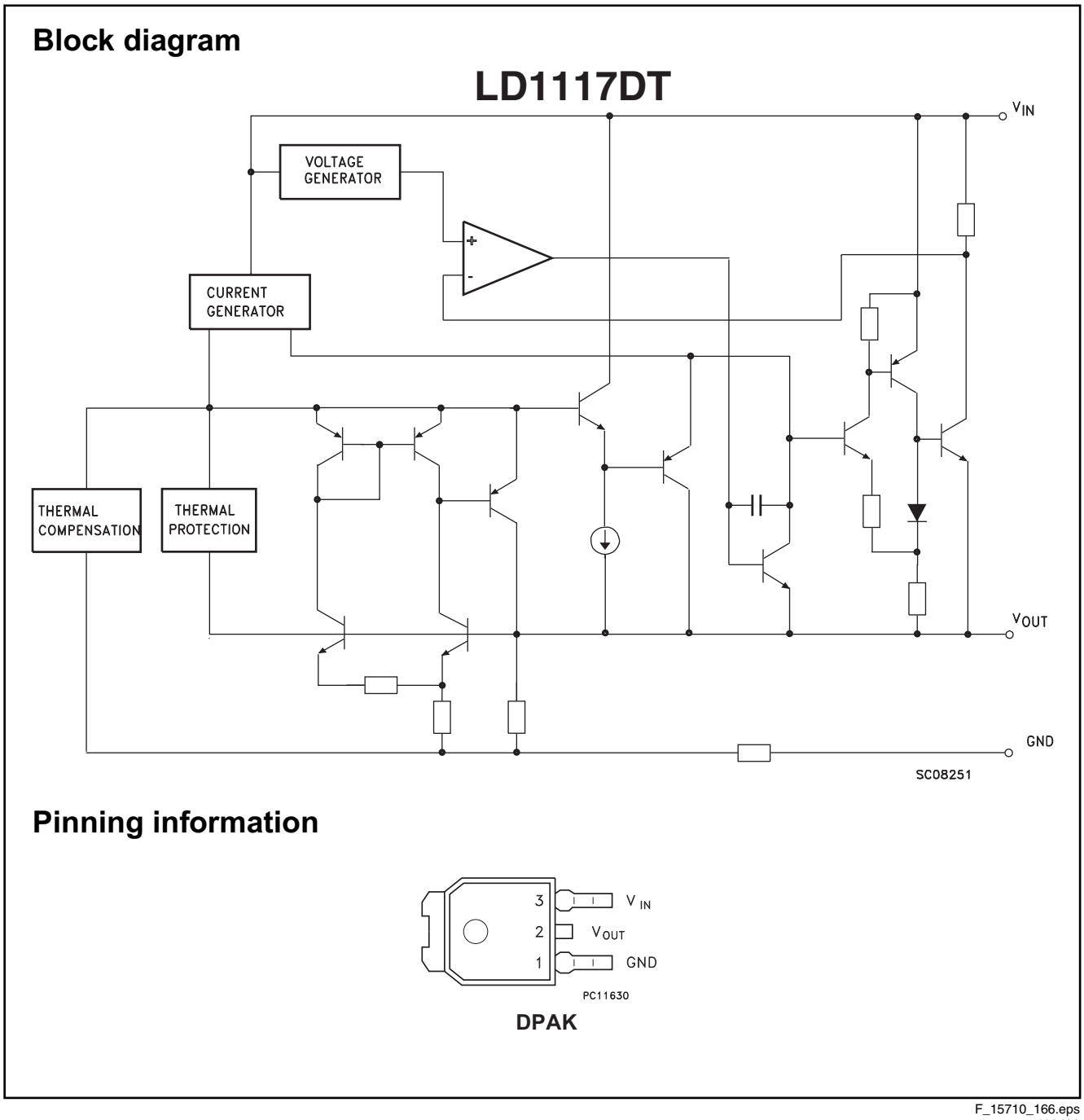


PowerSO-8

I_18010_083.eps
100402

Figure 8-6 Internal block diagram and pin configuration

8.7 Diagram DC/DC B03E, LD1117DT25 (IC 7UD2)

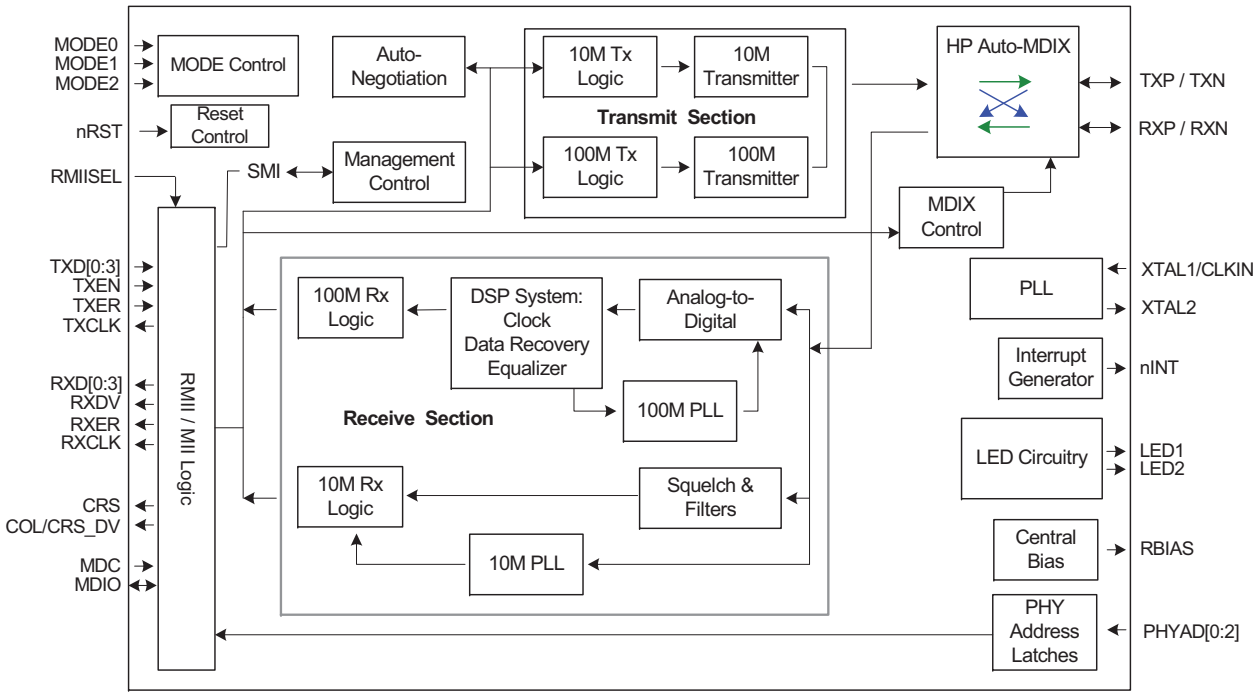


F_15710_166.eps
100402

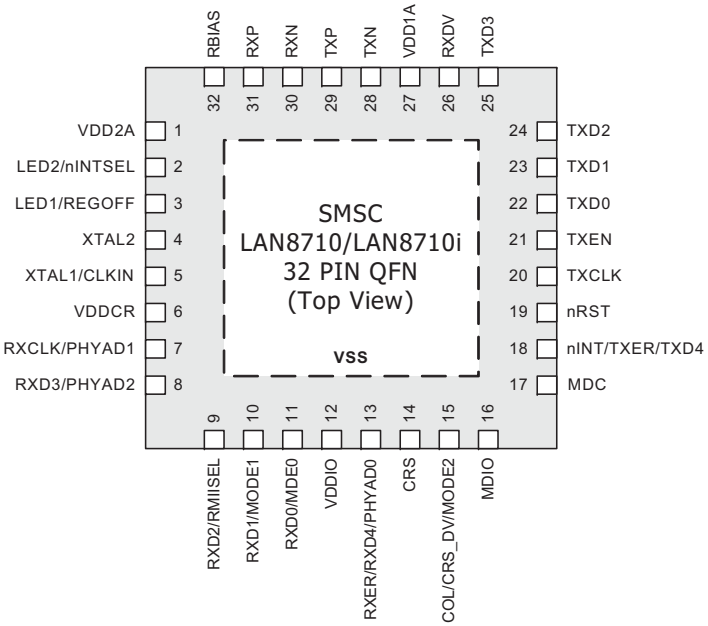
Figure 8-7 Internal block diagram and pin configuration

8.8 Diagram Ethernet + Service B04C, LAN8710A-EZKH (IC 7E10)

Block diagram



Pinning information

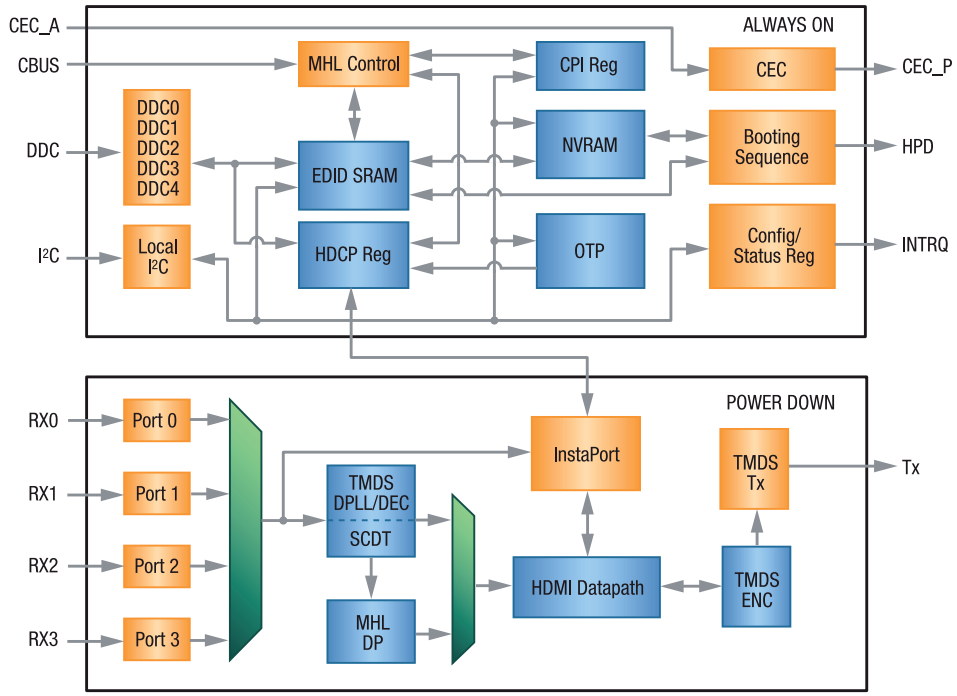


18770_302_100217.eps
100217

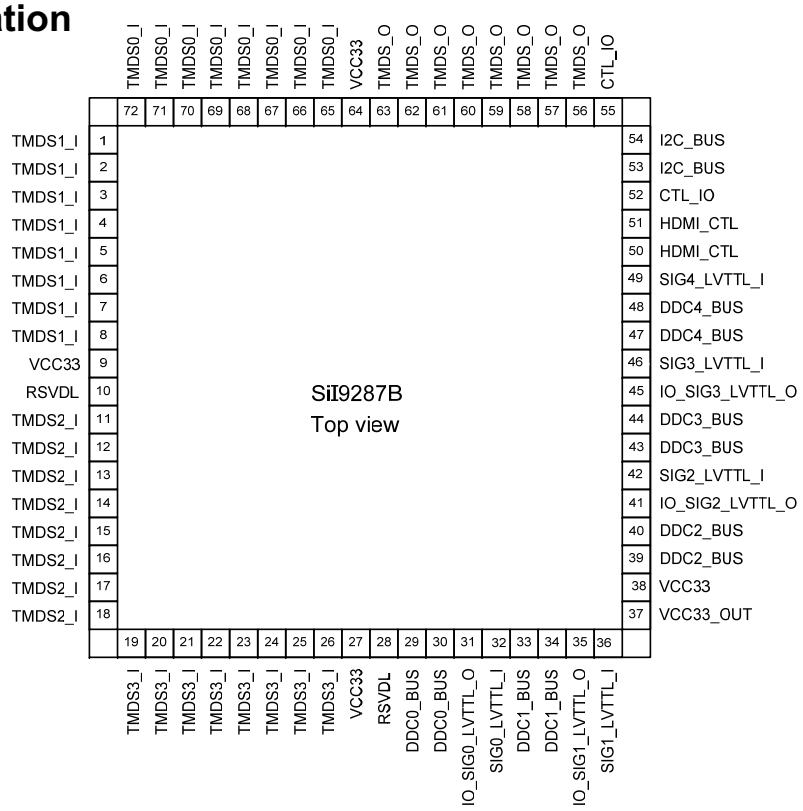
Figure 8-8 Internal block diagram and pin configuration

8.9 Diagram HDMI B04D, SII9287B (IC 7EC1)

Block diagram



Pinning information

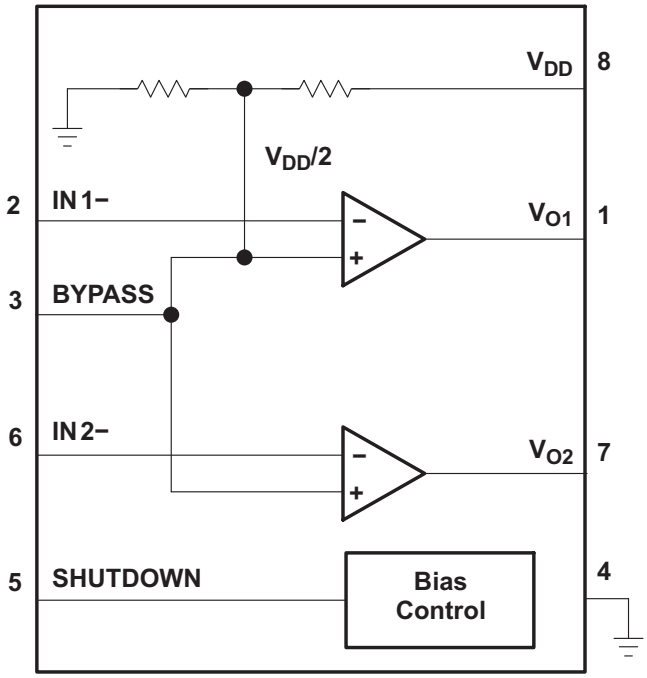


18770_303_100217.eps
100217

Figure 8-9 Internal block diagram and pin configuration

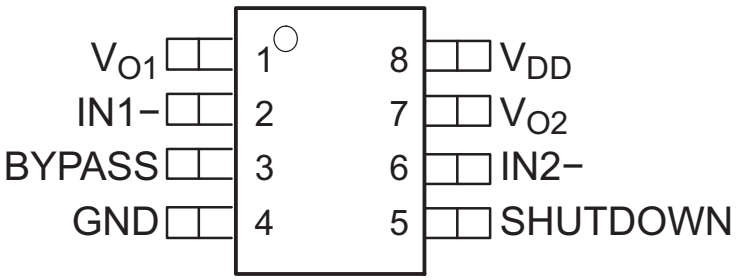
8.10 Diagram Headphone B04E, TPA6111A2DGN (IC 7EE1)

Block diagram



Pinning information

D OR DGN PACKAGE
(TOP VIEW)



18770_309_100217.eps
100217

Figure 8-10 Internal block diagram and pin configuration

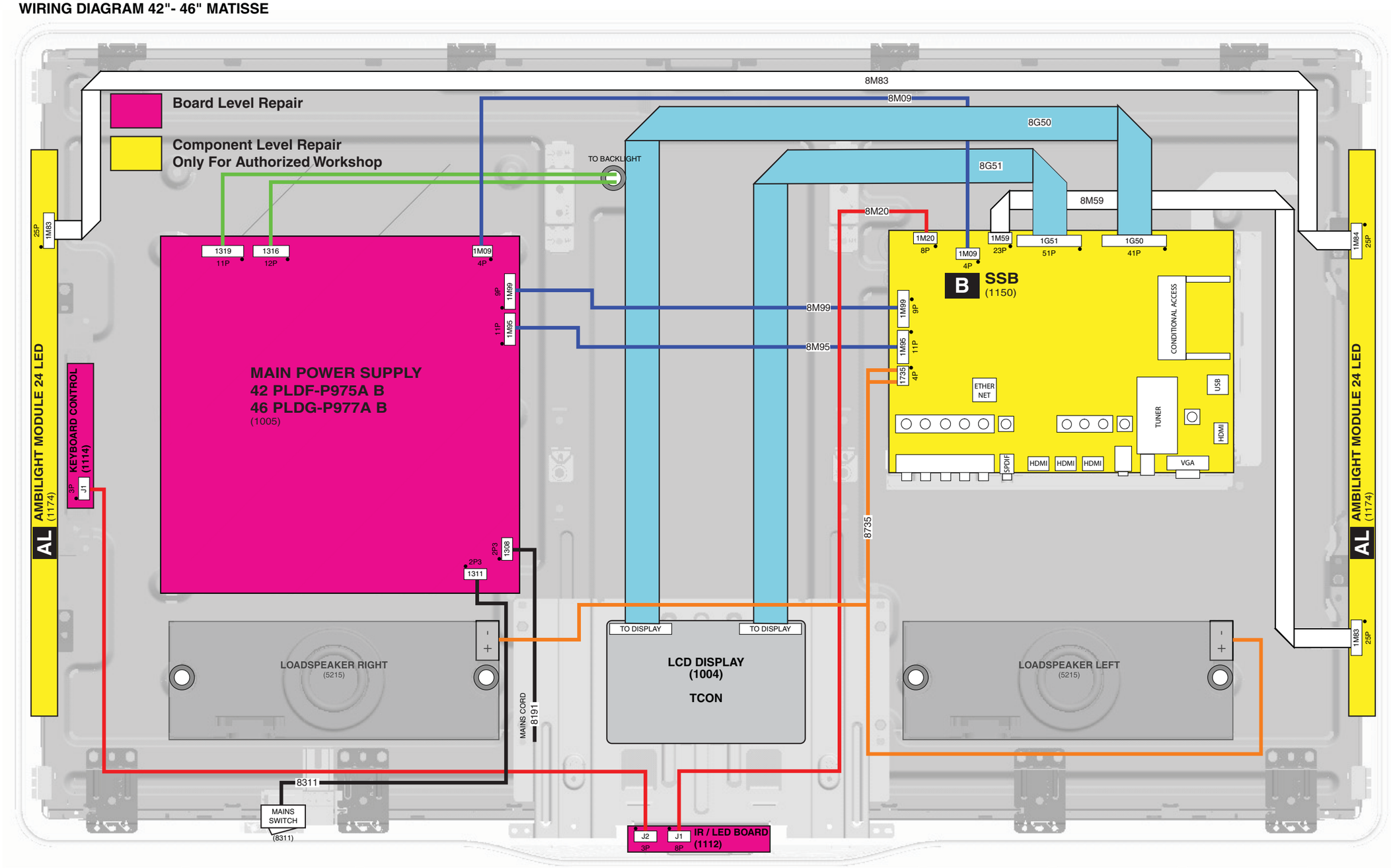
Personal Notes:

10000_012_090121.eps
090121

9. Block Diagrams

9-1 Wiring diagram Matisse 42" - 46"

WIRING DIAGRAM 42"- 46" MATISSE



1M59 (B13)
1. AMBI-SPI-CLK-OU
2. AMBI-SPI-SDO-OUT
3. AMBI-SPI-SDI-OUT-GI
4. GND
5. AMBI-PWM-CLK_B2
6. V-AMBI
7. AMBI-SPI-CS-OUTn_R2
8. AMBI-LATCH1_G2
9. GND
10. AMBI-PROG_B1
11. AMBI-BLANK_R1
12. V-AMBI
13. AMBI-LATCH2_DIS
14. AMBI-SPI-CS-EXTLAMPSn
15. AMBI-TEMP
16. GND
17. GND
18. GND
19. GND
20. GND
21. +24V
22. +24V
23. +24V
24. +24V
25. +24V

1M38 (AL1A)
1. +24V
2. +24V
3. +24V
4. +24V
5. +24V
6. GND
7. GND
8. GND
9. GND
10. GND
11. TEMP-SENSOR
12. N.C.
13. N.C.
14. +3V3
15. BLANK
16. PROG
17. GND
18. LATCH
19. SPI-CS
20. +3V3
21. PWM-CLOCK
22. GND
23. SPI-DATA-RETURN
24. SPI-DATA-IN
25. SPI-CLOCK

1M48 (AL2A)
1. SPI-CLOCK-BUF
2. SPI-DATA-OUT
3. SPI-DATA-RETURN
4. GND
5. PWM-CLOCK-BUF
6. +3V3
7. SPI-CS
8. LATCH
9. GND
10. PROG
11. BLANK
12. +3V3
13. N.C.
14. N.C.
15. TEMP-SENSOR
16. GND
17. GND
18. GND
19. GND
20. GND
21. +24V
22. +24V
23. +24V
24. +24V
25. +24V

1M95 (B03C)
1. +3V3-STANDBY
2. STANDBY
3. GND
4. GND
5. GND
6. +12V
7. +12V
8. +12V
9. +24V-AUDIO-POWER
10. GND-AUDIO
11. MAINS-OK

1M99 (B03C)
1. +12VD
2. +12VD
3. GND
4. GND
5. LAMP-ON
6. BACKLIGHT-PWM_BL-VS
7. BACKLIGHT-BOOST
8. BACKLIGHT-PWM-ANA-DISP
9. POWER-OK

1M20 (B09A)
1. LIGHT-SENSOR
2. GND
3. RC
4. LED-2
5. +3V3-STANDBY
6. LED-1
7. KEYBOARD
8. +5V

1735 (B03A)
1. LEFT-SPEAKER
2. GND-AUDIO
3. GND-AUDIO
4. RIGHT-SPEAKER

1M09 (B09)
1. +24V
2. +24V
3. GND
4. GND

1KA1 (B14E)
1. GND
|
11. VLS_15V6
12. VLS_15V6
|
33. VCC_3V3
34. VCC_3V3
|
78. VGH_25V
79. VGL_6V
80. GND

1KA2 (B14E)
1. GND
|
11. VLS_15V6
12. VLS_15V6
|
33. VCC_3V3
34. VCC_3V3
|
78. VGH_25V
79. VGL_6V
80. GND

18990_400_100330.eps
100330

9-2 Block Diagram Video

VIDEO

B01A COMMON INTERFACE

PCMCIA

CONDITIONAL ACCESS

1P00 68P

+5VCA

7F01 74LVC245APW

+3V3

MDO(0-7) BUFFER CA-MDO(0-7)

CA-MDI(0-7)

B01F HDMI & CI

1T01 TH2603

RF IN

MAIN HYBRID TUNER

IF-OUT1 IF-OUT2

10 TUN-IF-P 11 TUN-IF-N

5F73 5F70 2F90 1F75 SAW 36MHZ17 2F74 2F78

7F75 UPC3221GV

VCC AGC AMPLIFIER IN OUT AGC CONTROL

3F79-1 3F79-4

BANDPASS FILTER

PNX-IF-P PNX-IF-N

B02E CONTROL SELECT-SAW

7F70

PNX-IF-AGC

B02 PNX85500

7S00 PNX85507EB

B02A VIDEO STREAM

MD0 MDI

B02F LVDS

B02I ANALOG VIDEO

AE12 TUNER_P

AF12 TUNER_N

AD12 IF_AGC

PNX85500

B02E CONROL

USB_DN USB_DP

B02A FLASH

XIO_D

B02B MEMORY

DQ A

VREF_1 VREF_2

B02C HDMI_DV

RXC_B_N RXC_B_P RX0_B_N RX0_B_P RX1_B_N RX1_B_P RX2_B_N RX2_B_P RREF

B06B VIDEO OUT - LVDS

1G50 1G51

PX1 PX2 PX3 PX4

TO DISPLAY (TCON ON DISPLAY)

TO TCON SSB

N.C.

QUAD LVDS 1920x1080 100/120HZ

I2C

+VDISP

B14A TCON CONTROL (SHARP)

7KAA UPD809900F

TIMING CONTROL

SSB 3104 313 6364*

B14C P GAMMA & VOM & FLASH

7KQB M25P32

SPI SDO SCS SCK

FLASH

L_LV R_LV

7KQA ISL24837IRZ

REF VOLTAGE GEN

GMA

B14D MPD

7KUE MAX17079GTL

LEVEL SHIFTER

CS(1-12) CS(1U-12U)

B14E MINI LVDS (SHARP)

1KA1 1KA2

+VDD +VCC

TO DISPLAY (TCON ON SSB)

SSB 3104 313 6400*

B01C USB HUB

+5V-USB2 +5V-USB1

1P08 1P07

SIDE USB CONNECTOR

8000 Serie 6000 Serie

9F26 9F25 9F21 9F20

USB-DM2 USB-DP2 USB-DM1 USB-DP1

R26 R25

USB-DM USB-DP

B01B FLASH

7F20 *NAND02GW3B2DN6F NAND04GW3B2DN6F

NAND FLASH 256MB 512MB

XIO-D(00-07)

VCC 12,37 +3V3

*6000 Serie 256MB 8000 Serie 512MB

B05A DDR

7B00 *EDE1116AGBG EDE1108AGBG

7B02 *EDE1116AEBG EDE1108AGBG

7B03 EDE1108AGBG

7B01 EDE1108AGBG

SDRAM 128MB

D(0-7) D(8-15) D(16-23) D(24-31)

VDDL VREF A1 E2

DDR2-D(0-31)

DDR2-A(0-13)

+1V8

DDR2-VREF-DDR

6000 Serie 256MB 8000 Serie 512MB

A2 V1

DDR2-VREF-CTRL2 DDR2-VREF-CTRL3

B01H HDMI

HDMI SIDE CONNECTOR

1P05

DRX2+ DRX2- DRX1+ DRX1- DRX0+ DRX0- DRXC+ DRXC-

90 89 87 86 84 83 81 80

RXD

HDMI 3 CONNECTOR

1P04

ARX2+ ARX2- ARX1+ ARX1- ARX0+ ARX0- ARXC+ ARXC-

23 22 20 19 17 16 14 13

RXA

Only 8000 Serie

+3V3-HDMI 9,27,64 VCC33

HDMI 2 CONNECTOR

1P03

BRX2+ BRX2- BRX1+ BRX1- BRX0+ BRX0- BRXC+ BRXC-

42 41 39 39 36 35 33 32

RXB

HDMI 1 CONNECTOR

1P02

CRX2+ CRX2- CRX1+ CRX1- CRX0+ CRX0- CRXC+ CRXC-

72 71 69 68 66 65 63 62

RXC

B01D HDMI

7EC1 *SII9187ACNU SII9287BCNU

HDMI SWITCH

*6000 Serie mux SIL9187 - non Instaport

8000 Serie mux SIL9287 - Instaport

B04A ANALOGUE EXTERNALS A

1E01 1E02

EXT 1 Pr Y Pb

AV1-R AV1-G AVI-B

AC13 AE13 AD13

AV1_R AV1_G AV1_B

EXT 2 Pr Y Pb

AV4-PR AV4-Y AV4-PB

AC14 AE14 AD14

AI33 AI13 AI23

B01I VGA

1E05

VGA CONNECTOR

R-VGA G-VGA B-VGA H-SYNC-VGA V-SYNC-VGA

AF16 AD16 AE16 AB18 AC18

VGA_R VGA_G VGA_B HSYNC_IN VSYNC_IN

B04B ANALOGUE EXTERNALS B

AC15 PR_R_C1

EXT 3 1E08 VIDEO

AV3-Y

AE15 Y_G1

AD15 PB_B1

1ECB SVHS IN

Y-SVHS C-SVHS

AC12 AF13

ATV_CVBS_Y3 CR

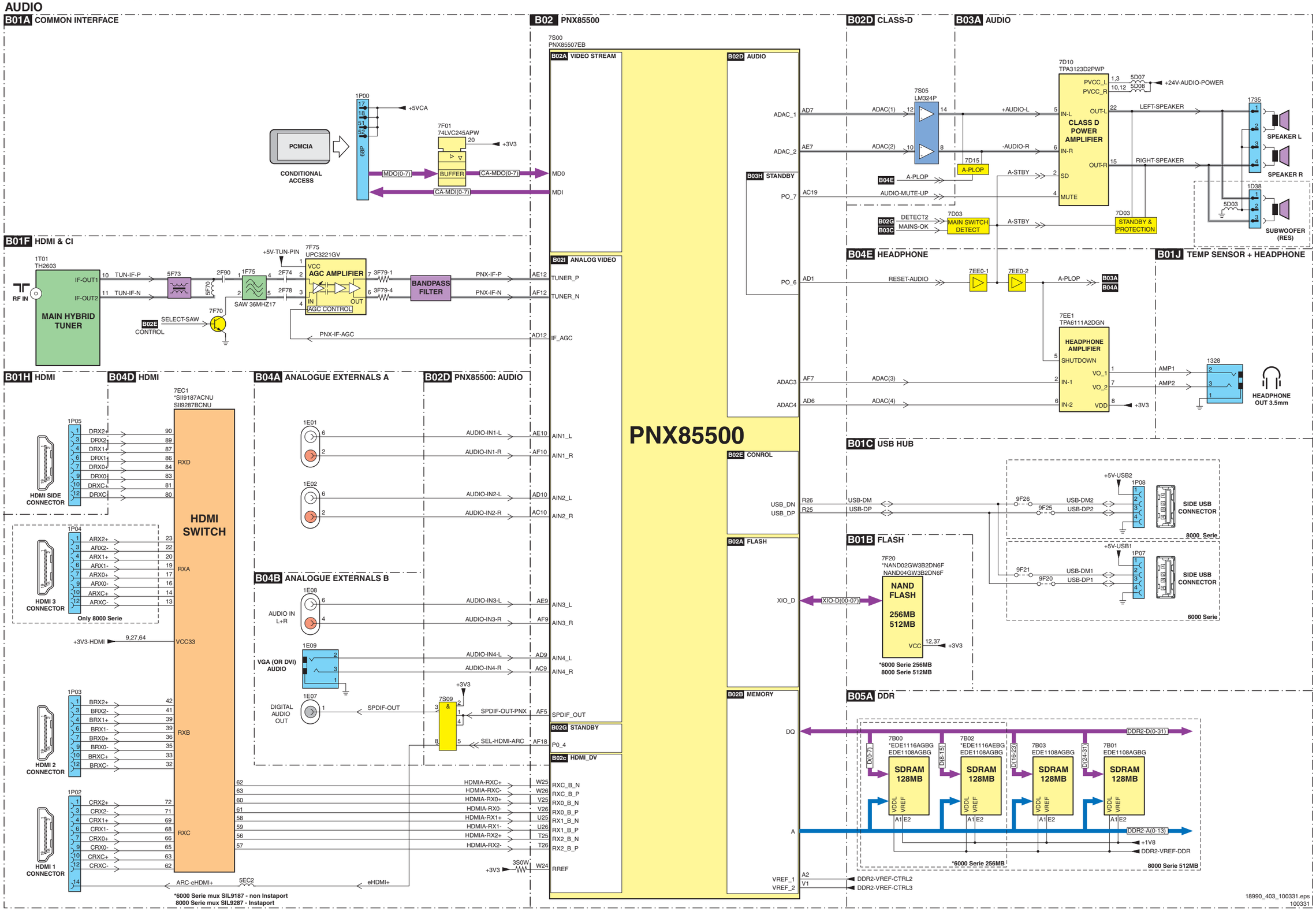
HDMIA-RXC+ HDMIA-RXC- HDMIA-RX0+ HDMIA-RX0- HDMIA-RX1+ HDMIA-RX1- HDMIA-RX2+ HDMIA-RX2-

W25 W26 V25 V26 U25 U26 T25 T26

3S0W +3V3 W24

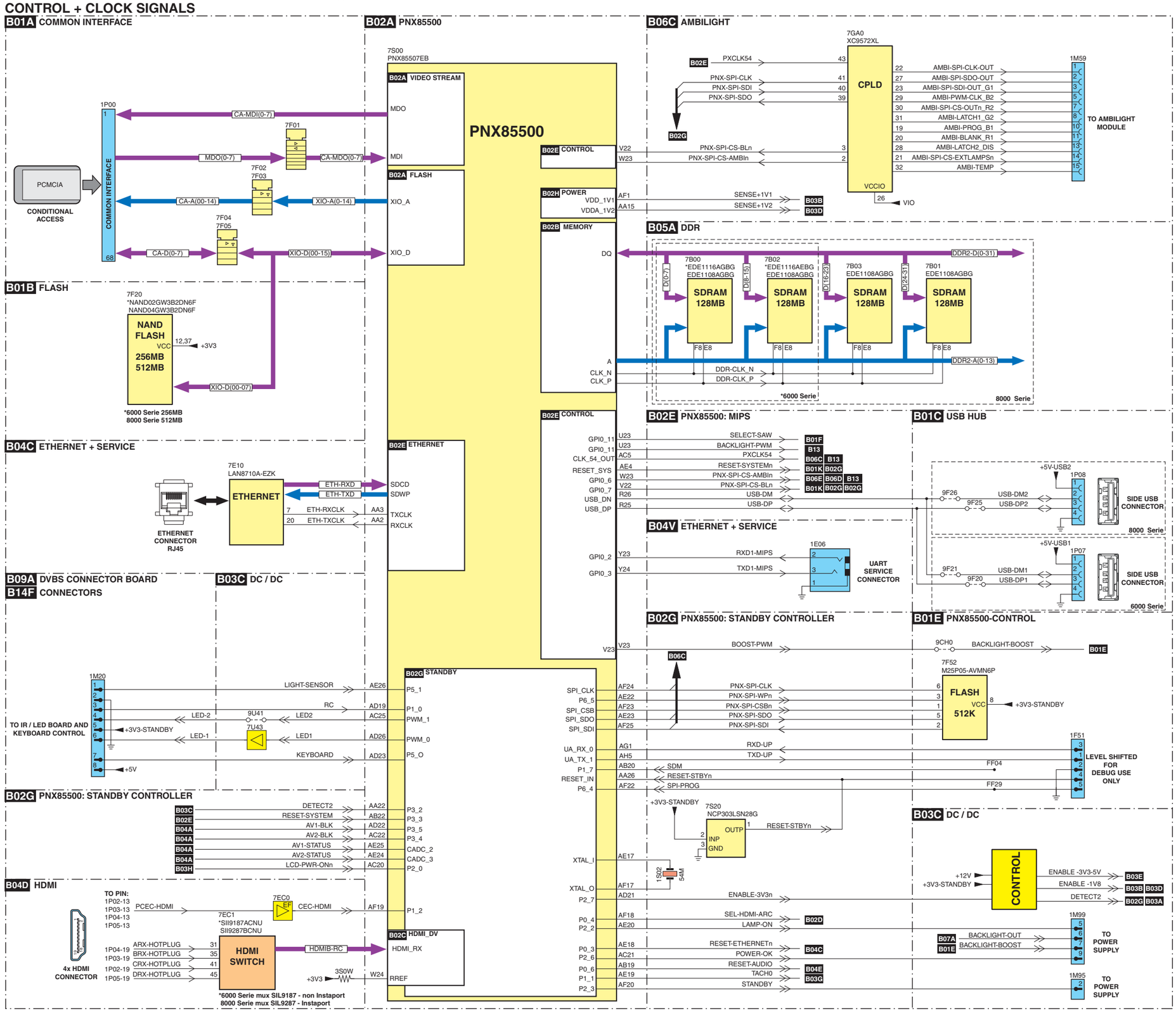
18990_402_100331.eps 100331

9-3 Block Diagram Audio



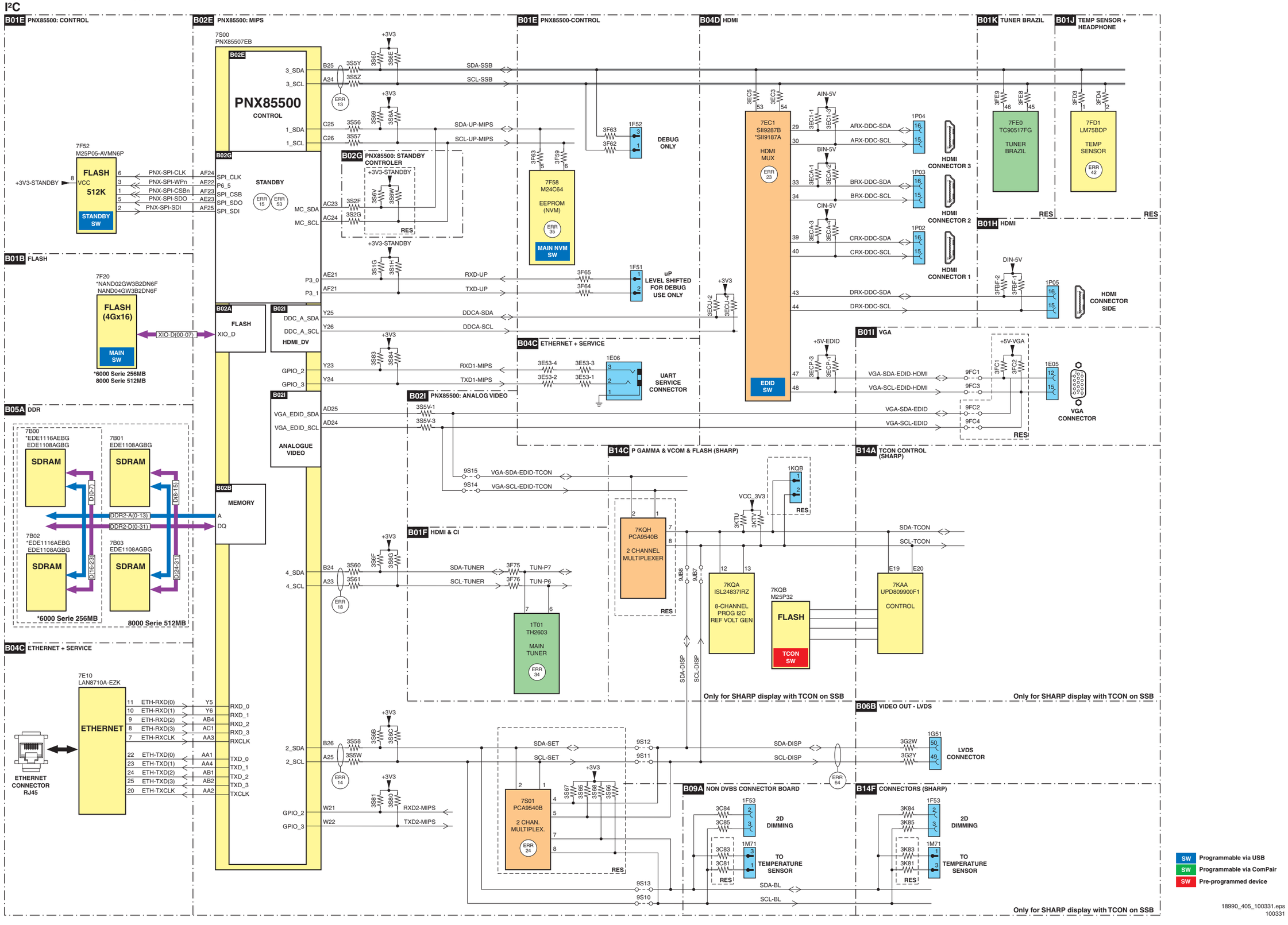
9-4 Block Diagram Control & Clock Signals

CONTROL + CLOCK SIGNALS



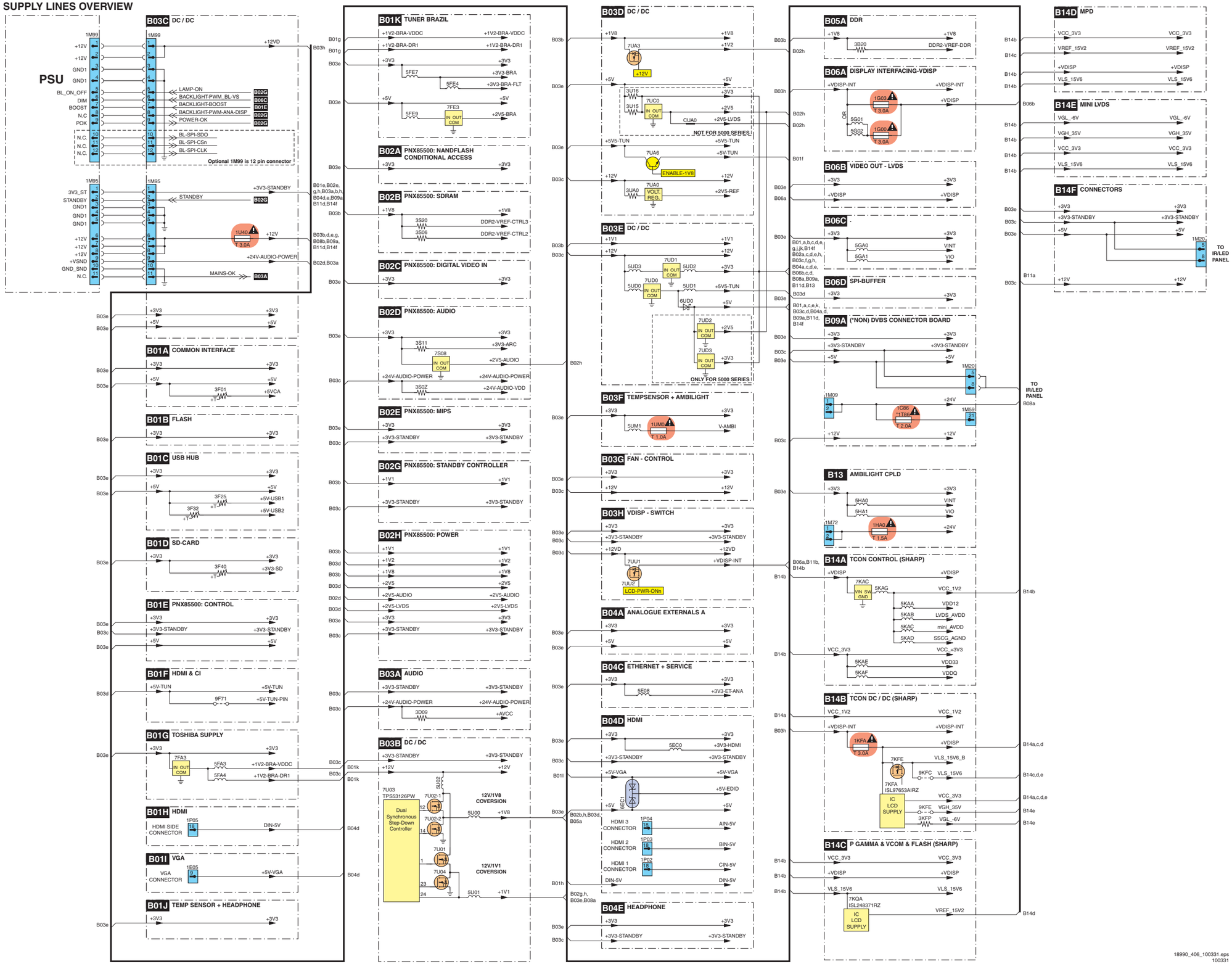
18990_404_100331.eps
100331

9-5 Block Diagram I²C



9-6 Supply Lines Overview

SUPPLY LINES OVERVIEW



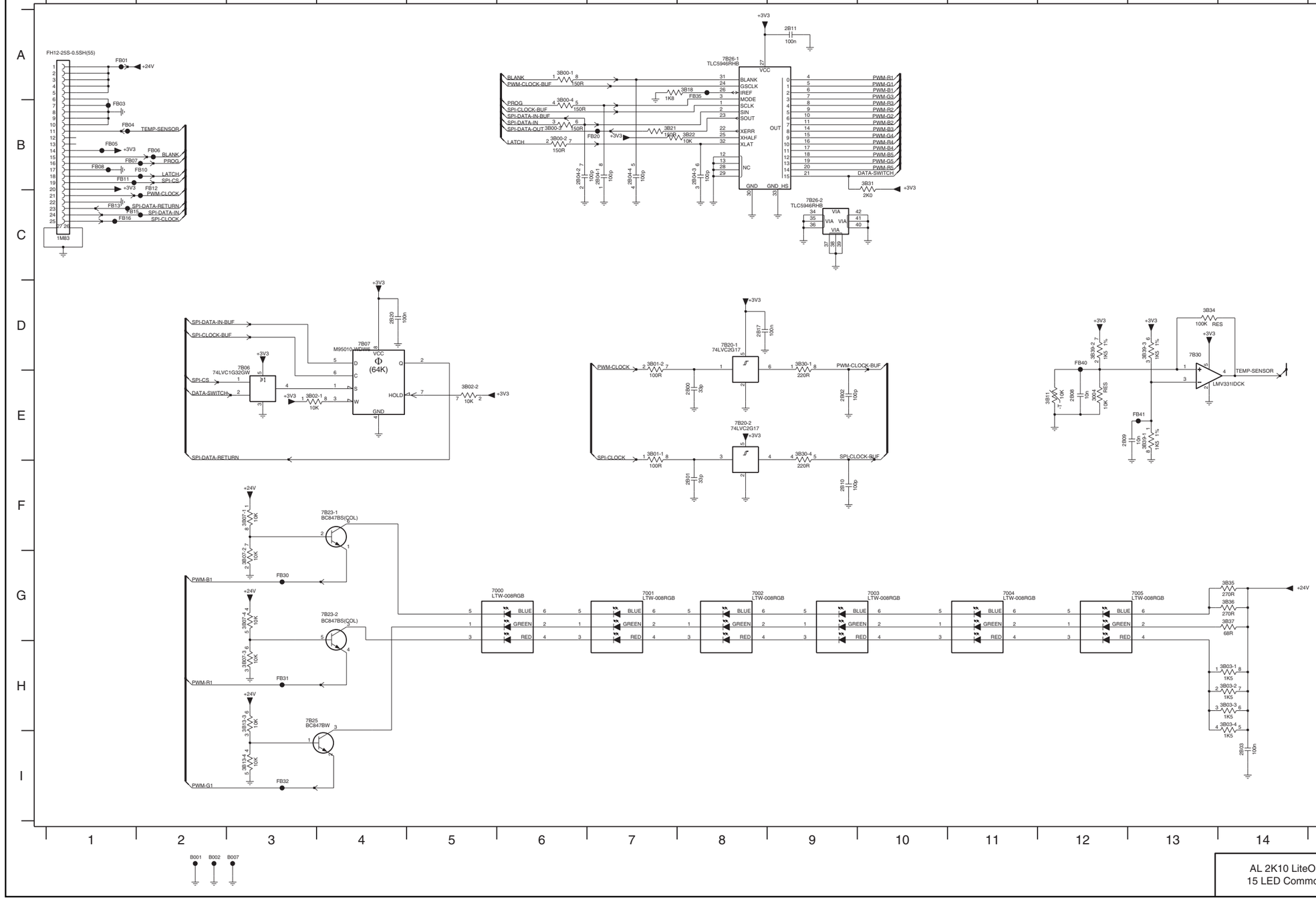
10. Circuit Diagrams and PWB Layouts

10-1 AL1 820400089786 AmbiLight Common

LiteOn LED Common 1

AL1A LiteOn 15 LED Common

AL1A



1M83 C1
2B00 E8
2B01 F8
2B02 E9
2B03 I14
2B04-1 B7
2B04-2 B6
2B04-3 B8
2B04-4 B7
2B08 E12
2B09 E12
2B10 F9
2B11 A9
2B17 D8
2B20 D4
3004 E12
3B00-1 A6
3B00-2 B6
3B00-3 B6
3B00-4 B6
3B01-1 E7
3B01-2 D7
3B02-1 E3
3B02-2 E5
3B03-1 H14
3B03-2 H14
3B03-3 H14
3B03-4 H14
3B07-1 F3
3B07-2 G3
3B07-3 H3
3B07-4 G3
3B11 E12
3B13-3 H3
3B13-4 I3
3B18 A8
3B21 B7
3B22 B8
3B30-1 D9
3B30-4 E9
3B31 B10
3B34 D13
3B35 G14
3B36 G14
3B37 G14
3B39-1 E13
3B39-2 D12
3B39-3 D13
7000 G5
7001 G7
7002 G8
7003 G10
7004 G11
7005 G13
7B06 D3
7B07 D4
7B20-1 D8
7B20-2 E8
7B23-1 F4
7B23-2 G4
7B25 H3
7B26-1 A8
7B26-2 C9
7B30 D13
FB01 A1
FB03 B1
FB04 B1
FB05 B1
FB06 B2
FB07 B1
FB08 B1
FB10 B2
FB11 B1
FB12 B2
FB13 C1
FB15 C1
FB16 C1
FB20 B7
FB30 G3
FB31 H3
FB32 I3
FB35 A8
FB40 D12
FB41 E13

AL 2K10 LiteOn 15 LED Common	8204 000 8978

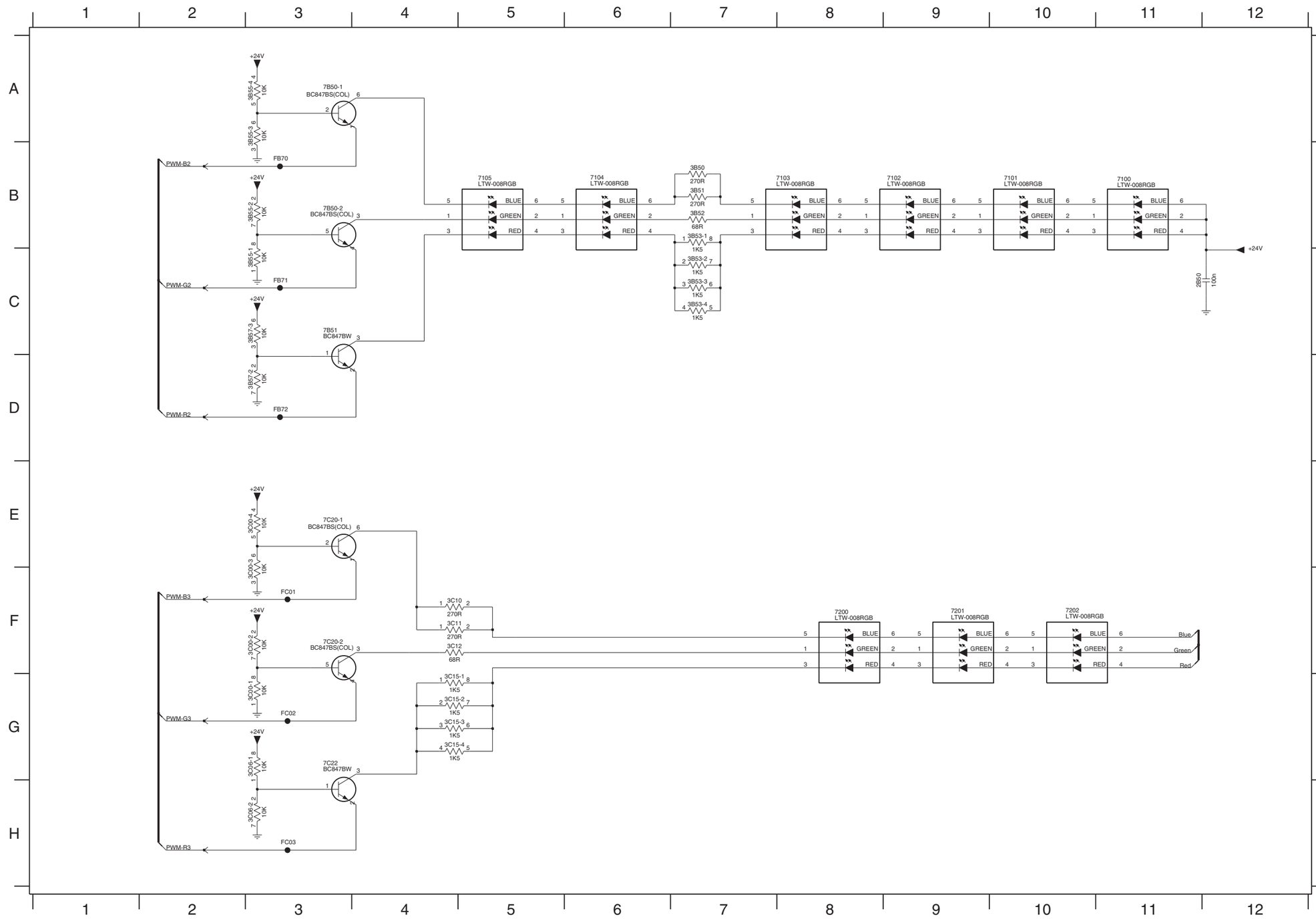
6	2009-12-04
5	2009-10-28
4	2009-10-07
3	2009-08-27
2	2009-07-03

18770_600_100212.eps
100218

LiteOn LED Common 2

AL1B LiteOn 15 LED Common 2

AL1B



2B50 C11
3B50 B7
3B51 B7
3B52 B7
3B53-1 B7
3B53-2 C7
3B53-3 C7
3B53-4 C7
3B55-1 C3
3B55-2 B3
3B55-3 A3
3B55-4 A3
3B57-2 D3
3B57-3 C3
3C00-1 G3
3C00-2 F3
3C00-3 F3
3C00-4 E3
3C06-1 G3
3C06-2 H3
3C10 F4
3C11 F4
3C12 F4
3C15-1 G4
3C15-2 G4
3C15-3 G4
3C15-4 G4
7100 B11
7101 B10
7102 B9
7103 B7
7104 B6
7105 B5
7200 F8
7201 F9
7202 F10
7B50-1 A3
7B50-2 B3
7B51 C3
7C20-1 E3
7C20-2 F3
7C22 G3
FB70 B3
FB71 C3
FB72 D3
FC01 F3
FC02 G3
FC03 H3

AL 2K10 LiteOn 15 LED Common	8204 000 8978	6 2009-12-04 5 2009-10-28 4 2009-10-07 3 2009-08-27 2 2009-07-03

18770_601_100212.eps
100212

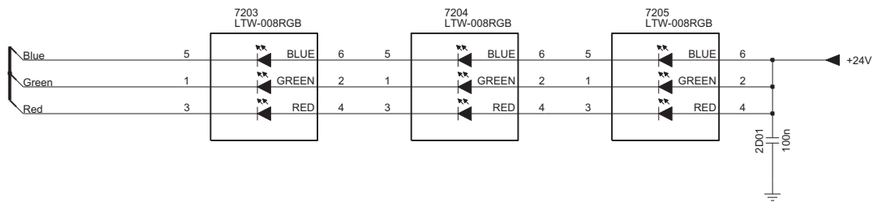
10-2 AL1 820400089691 9 LED LiteOn

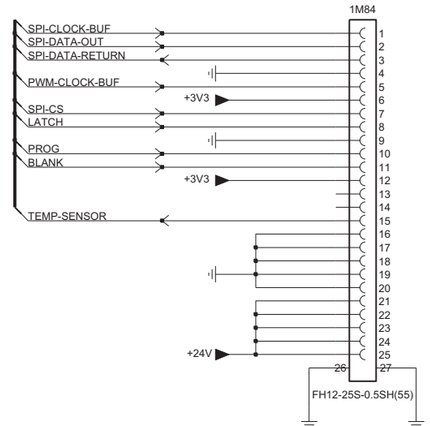
9 LED LiteOn

AL2A 9 LED LiteOn

AL2A

1M84 A10
2D01 B6
7203 A3
7204 A4
7205 A5





FD04

B003 B004

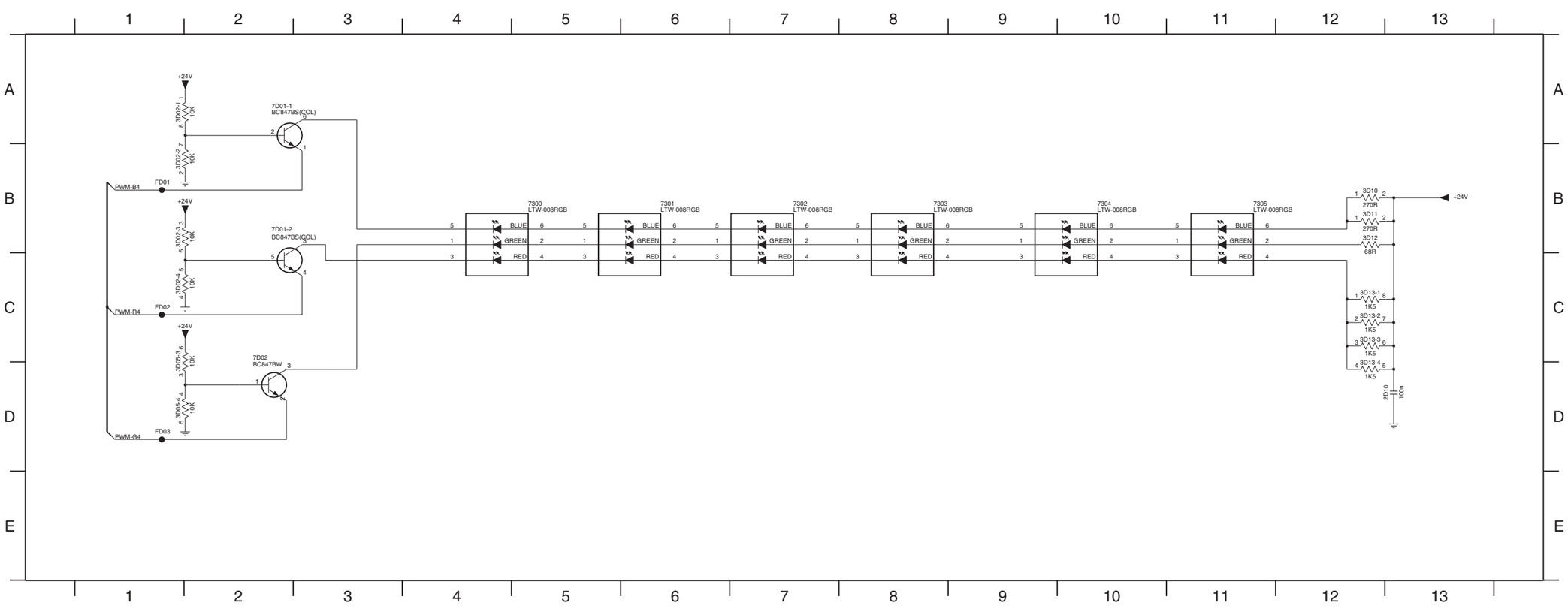
9 LED LiteOn AL 2K10	8204 000 8969 3104 313 63812	1 2009-10-07

18770_610_100212.eps
100218

9 LED LiteOn

AL2B 9 LED LiteOn

AL2B



2D10 D13
3D02-1 A1
3D02-2 B1
3D02-3 B1
3D02-4 C1
3D05-3 C1
3D05-4 D1
3D10 B12
3D11 B12
3D12 B12
3D13-1 C12
3D13-2 C12
3D13-3 C12
3D13-4 D12
7300 B5
7301 B6
7302 B7
7303 B8
7304 B10
7305 B11
7D01-1 A2
7D01-2 B2
7D02 C2
FD01 B1
FD02 C1
FD03 D1

9 LED LiteOn AL 2K10	8204 000 8969 3104 313 63812	1 2009-10-07

18770_611_100212.eps
100212

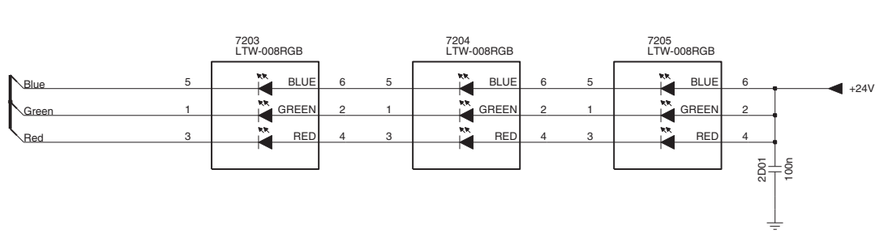
10-3 AL1 820400089703 15 LED LiteOn

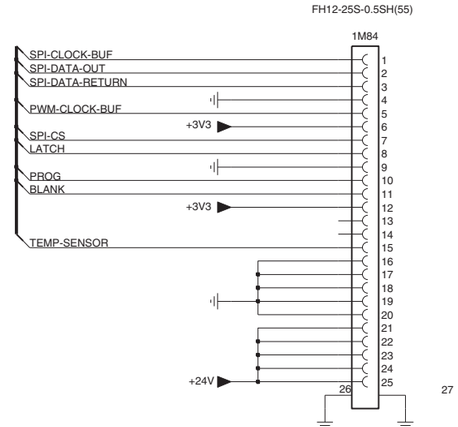
15 LED LiteOn

AL2A 15 LED LiteOn

AL2A

1M84 A10
2D01 B6
7203 A3
7204 A4
7205 A5
FD18 C7





FD18

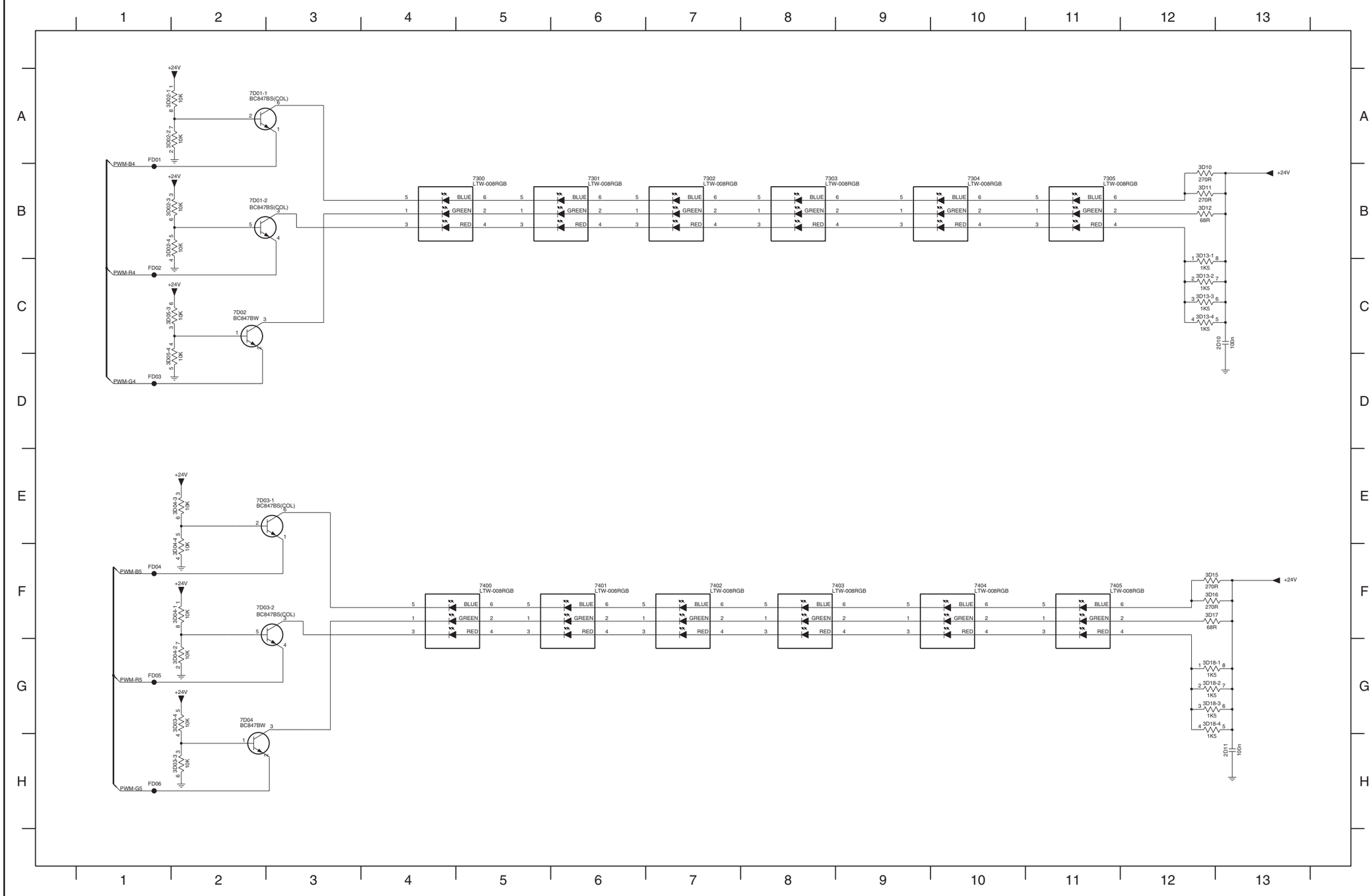
B003 B004 B005

15 LED LiteOn AL 2K10	8204 000 8970 3104 313 63823	3 2009-12-07 2 2009-10-07 1 2009-07-02

18770_620_100212.eps
100218

15 LED LiteOn

AL2B 15 LED LiteOn



AL2B

2D10 C13
2D11 H13
3D02-1 A1
3D02-2 A1
3D02-3 B1
3D02-4 B1
3D03-3 H2
3D03-4 G2
3D04-1 F2
3D04-2 G2
3D04-3 E2
3D04-4 F2
3D05-3 C1
3D05-4 D1
3D10 B12
3D11 B12
3D12 B12
3D13-1 B12
3D13-2 C12
3D13-3 C12
3D13-4 C12
3D15 F12
3D16 F12
3D17 F12
3D18-1 G12
3D18-2 G12
3D18-3 G12
3D18-4 G12
7300 B5
7301 B6
7302 B7
7303 B8
7304 B10
7305 B11
7400 F5
7401 F6
7402 F7
7403 F8
7404 F10
7405 F11
7D01-1 A2
7D01-2 B2
7D02 C2
7D03-1 E2
7D03-2 F2
7D04 G2
FD01 A1
FD02 C1
FD03 D1
FD04 F1
FD05 G1
FD06 H1

15 LED LiteOn AL 2K10	8204 000 8970 3104 313 63823	3 2009-12-07 2 2009-10-07 1 2009-07-02

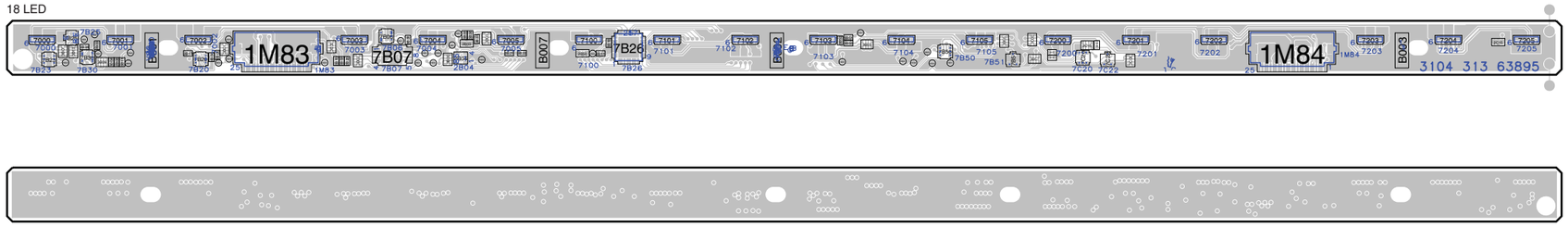
18770_621_100212.eps
100219

10-4 AL1 3104313 - 63895, 63812

Layout AmbiLight LiteOn

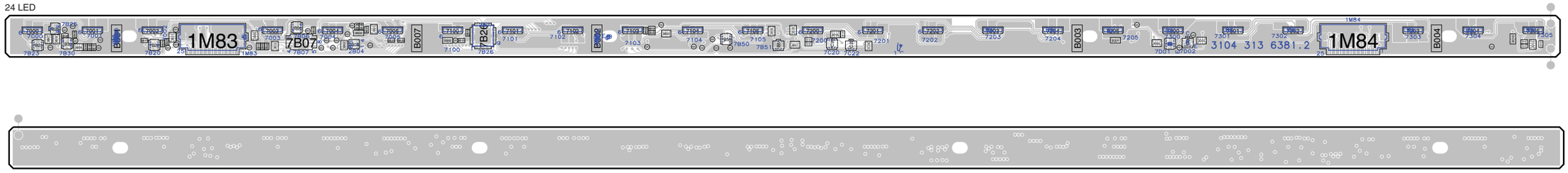
AmbiLight LiteOn

18 LED



3104 313 6389.5

24 LED



3104 313 6381.2

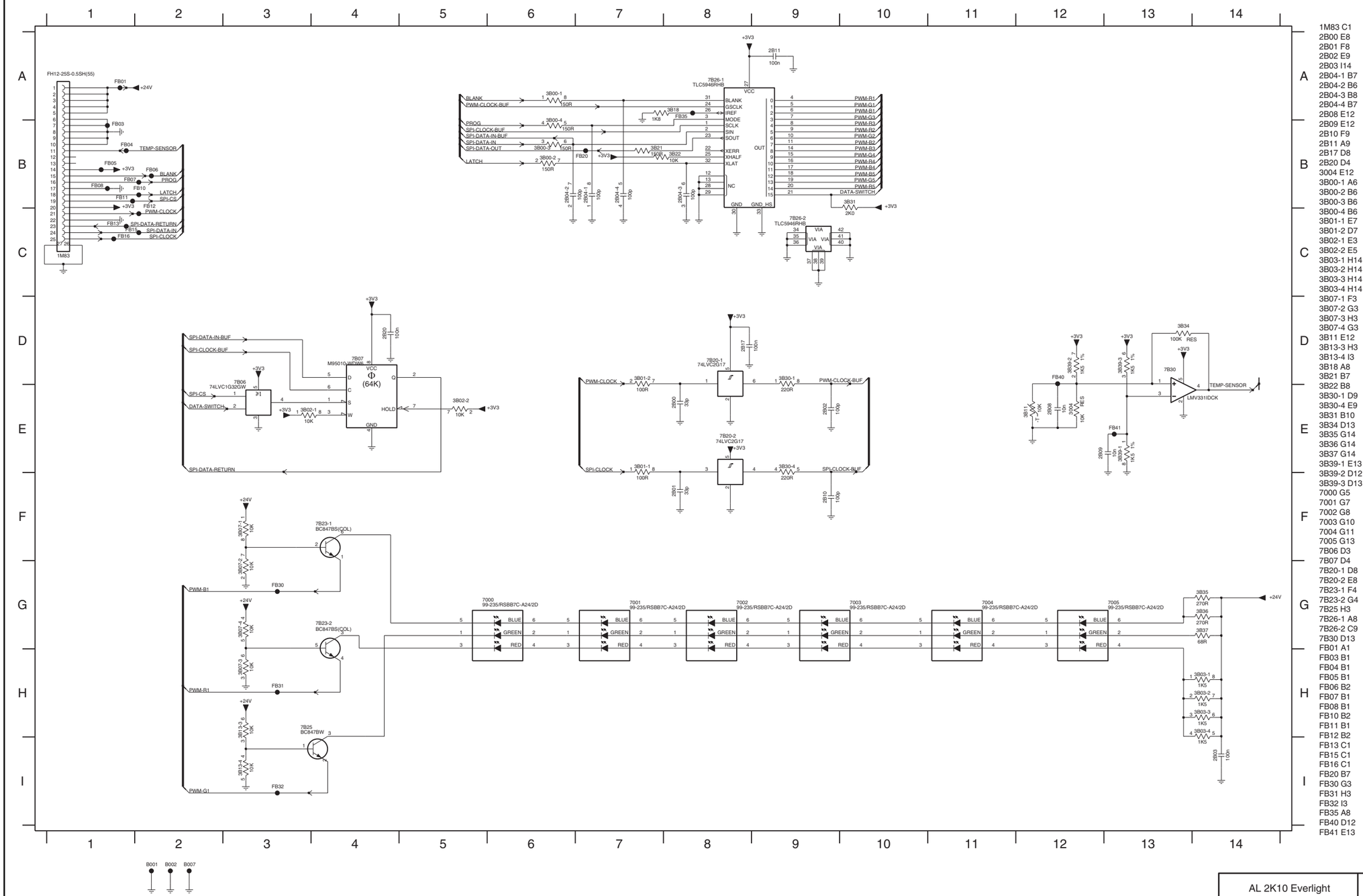
18770_602_100216.eps
100218

10-5 AL1 820400090592 AmbiLight Common

Everlight LED Common 1

AL1A Everlight 15 LED Common

AL1A



1M83 C1
2B00 E8
2B01 F8
2B02 E9
2B03 I14
A 2B04-1 B7
2B04-2 B6
2B04-3 B8
2B04-4 B7
2B08 E12
2B09 E12
2B10 F9
2B11 A9
2B17 D8
2B20 D4
B 3004 E12
3B00-1 A6
3B00-2 B6
3B00-3 B6
3B00-4 B6
3B01-1 E7
3B01-2 D7
3B02-1 E3
3B02-2 E5
C 3B03-1 H14
3B03-2 H14
3B03-3 H14
3B03-4 H14
3B07-1 F3
3B07-2 G3
3B07-3 H3
3B07-4 G3
D 3B11 E12
3B13-3 H3
3B13-4 I3
3B18 A8
3B21 B7
3B22 B8
3B30-1 D9
3B30-4 E9
3B31 B10
3B34 D13
3B35 G14
3B36 G14
3B37 G14
3B39-1 E13
E 3B39-2 D12
3B39-3 D13
7000 G5
7001 G7
7002 G8
7003 G10
7004 G11
7005 G13
7B06 D3
7B07 D4
7B20-1 D8
7B20-2 E8
7B23-1 F4
7B23-2 G4
F 7B25 H3
7B26-1 A8
7B26-2 C9
7B30 D13
FB01 A1
FB03 B1
FB04 B1
FB05 B1
FB06 B2
G FB07 B1
FB08 B1
FB10 B2
FB11 B1
FB12 B2
FB13 C1
FB15 C1
FB16 C1
FB20 B7
H FB30 G3
FB31 H3
FB32 I3
FB35 A8
FB40 D12
FB41 E13

AL 2K10 Everlight 15 LED Common	8204 000 9059	2 2009-11-27 1 2009-11-03

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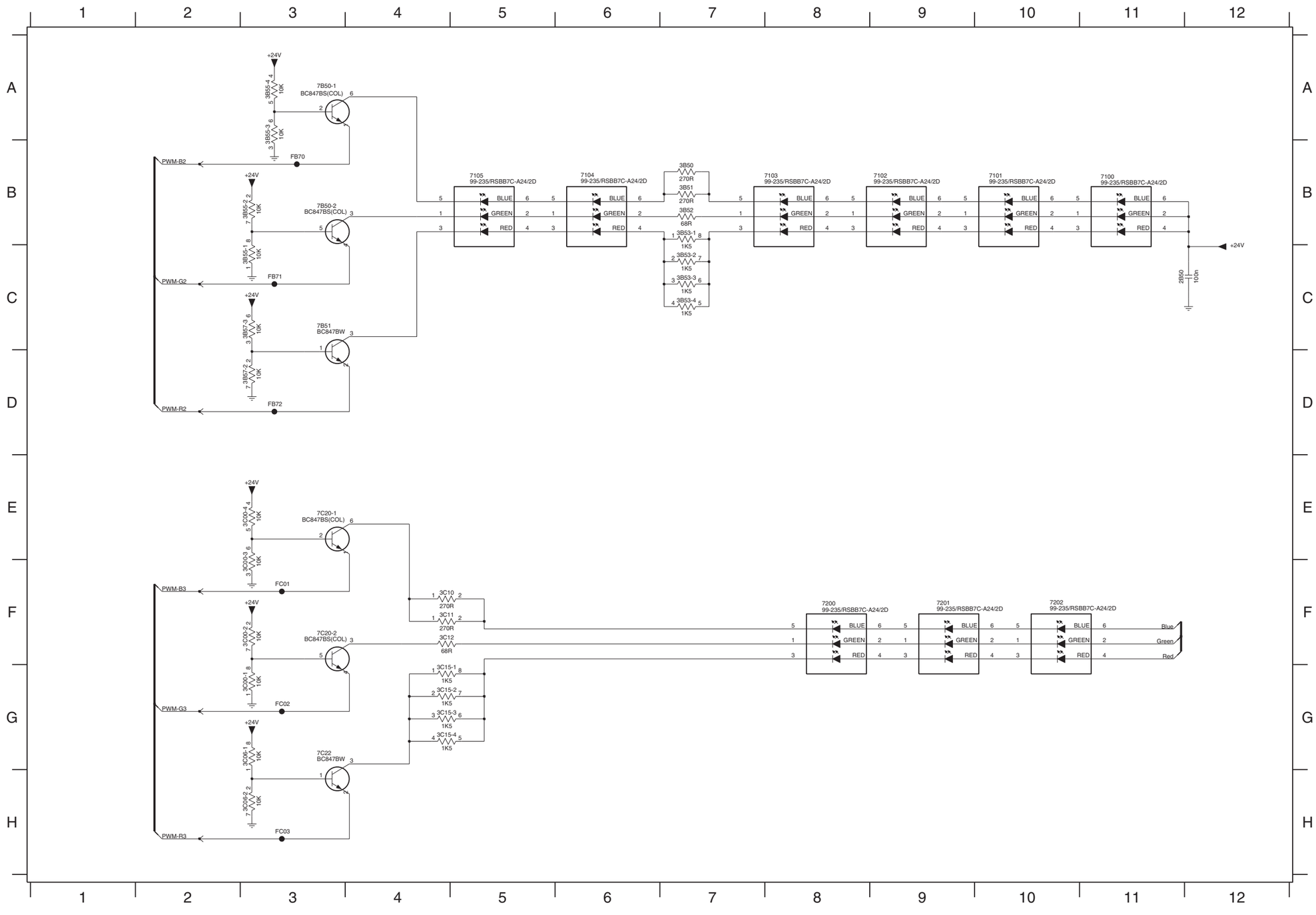
100219

Everlight LED Common 2

AL1B Everlight 15 LED Common 2

AL1B



2B50 C11
3B50 B7
3B51 B7
3B52 B7
3B53-1 B7
3B53-2 C7
3B53-3 C7
3B53-4 C7
3B55-1 C3
3B55-2 B3
3B55-3 A3
3B55-4 A3
3B57-2 D3
3B57-3 C3
3C00-1 G3
3C00-2 F3
3C00-3 F3
3C00-4 E3
3C06-1 G3
3C06-2 H3
3C10 F4
3C11 F4
3C12 F4
3C15-1 G4
3C15-2 G4
3C15-3 G4
3C15-4 G4
7100 B11
7101 B10
7102 B9
7103 B7
7104 B6
7105 B5
7200 F8
7201 F9
7202 F10
7B50-1 A3
7B50-2 B3
7B51 C3
7C20-1 E3
7C20-2 F3
7C22 G3
FB70 B3
FB71 C3
FB72 D3
FC01 F3
FC02 G3
FC03 H3

AL 2K10 Everlight 15 LED Common	8204 000 9059	2 2009-11-27 1 2009-11-03

18770_671_100212.eps
100212

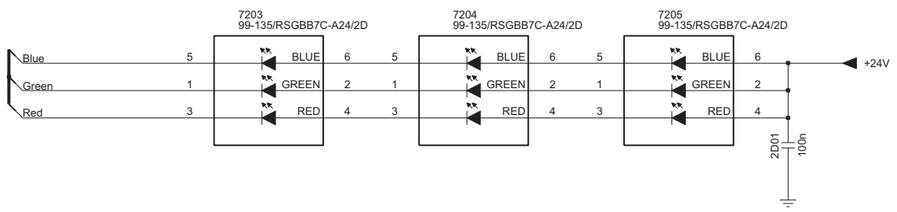
10-6 AL1 820400090601 9 LED Everlight

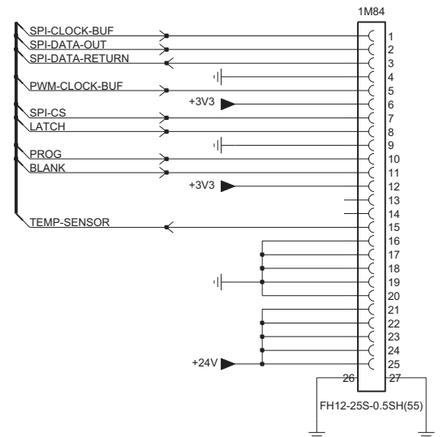
9 LED Everlight

AL2A 9 LED Everlight

AL2A

1M84 A10
2D01 B6
7203 A3
7204 A4
7205 A5





9 LED Everlight AL 2K10	8204 000 9060 3104 313 64191	1 2009-11-03

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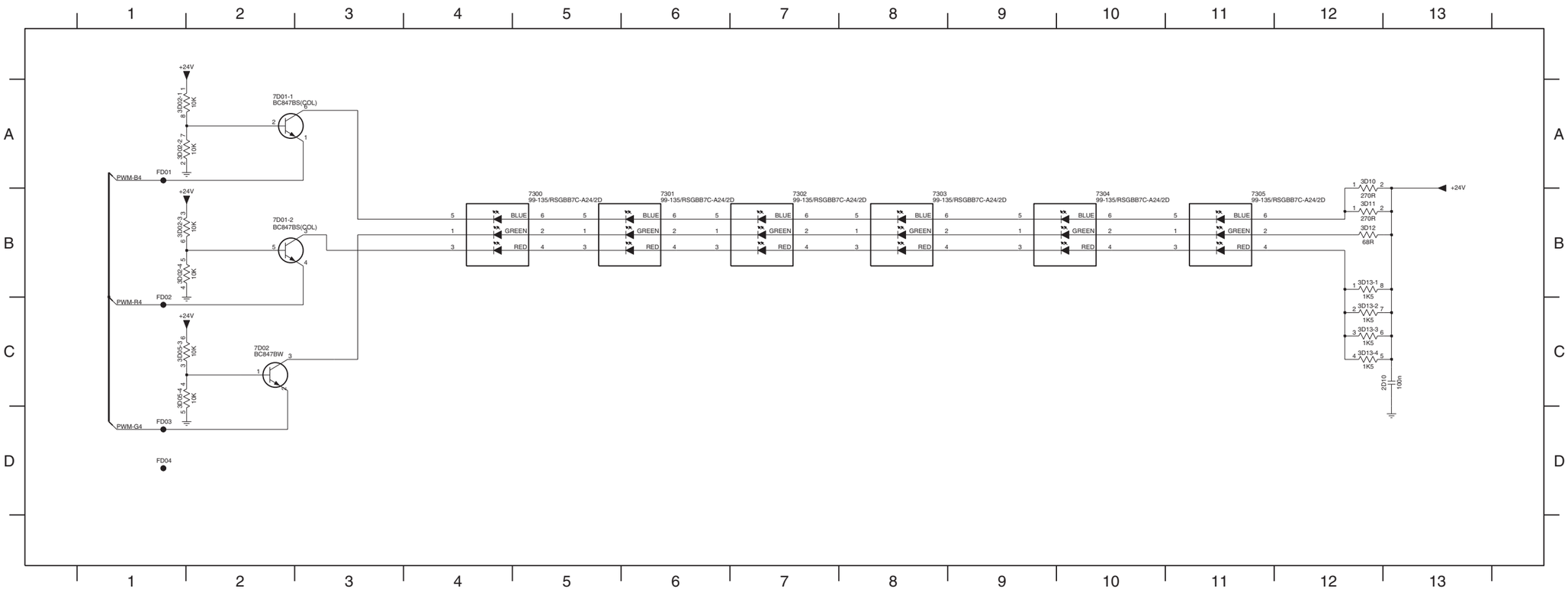
100219

9 LED Everlight

AL2B 9 LED Everlight

AL2B



2D10 C13
3D02-1 A1
3D02-2 A1
3D02-3 B1
3D02-4 B1
3D05-3 C1
3D05-4 C1
3D10 A12
3D11 B12
3D12 B12
3D13-1 B12
3D13-2 C12
3D13-3 C12
3D13-4 C12
7300 B5
7301 B6
7302 B7
7303 B8
7304 B10
7305 B11
7D01-1 A2
7D01-2 B2
7D02 C2
FD01 A1
FD02 C1
FD03 D1
FD04 D1

9 LED Everlight AL 2K10	8204 000 9060 3104 313 64191	1 2009-11-03

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100212

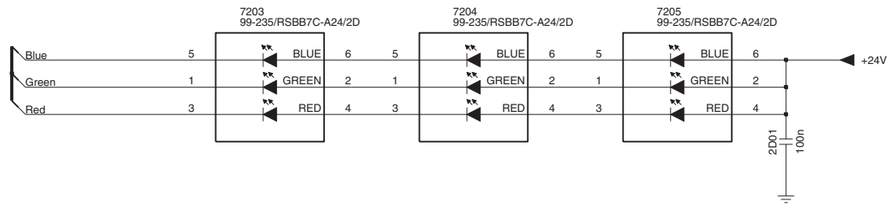
10-7 AL1 820400090621 15 LED Everlight

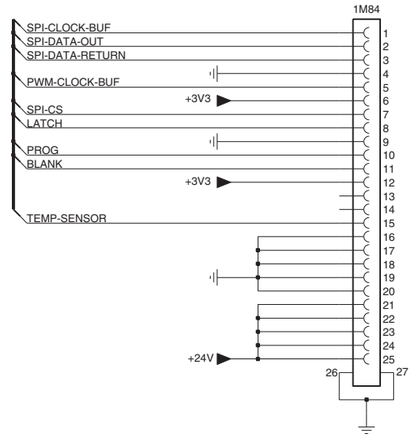
15 LED Everlight

AL2A 15 LED Everlight

AL2A

1M84 A10
2D01 B6
7203 A3
7204 A4
7205 A5
FD18 C7





FD18

B003 B004 B005

15 LED Everlight AL 2K10	8204 000 9062 3104 313 64211

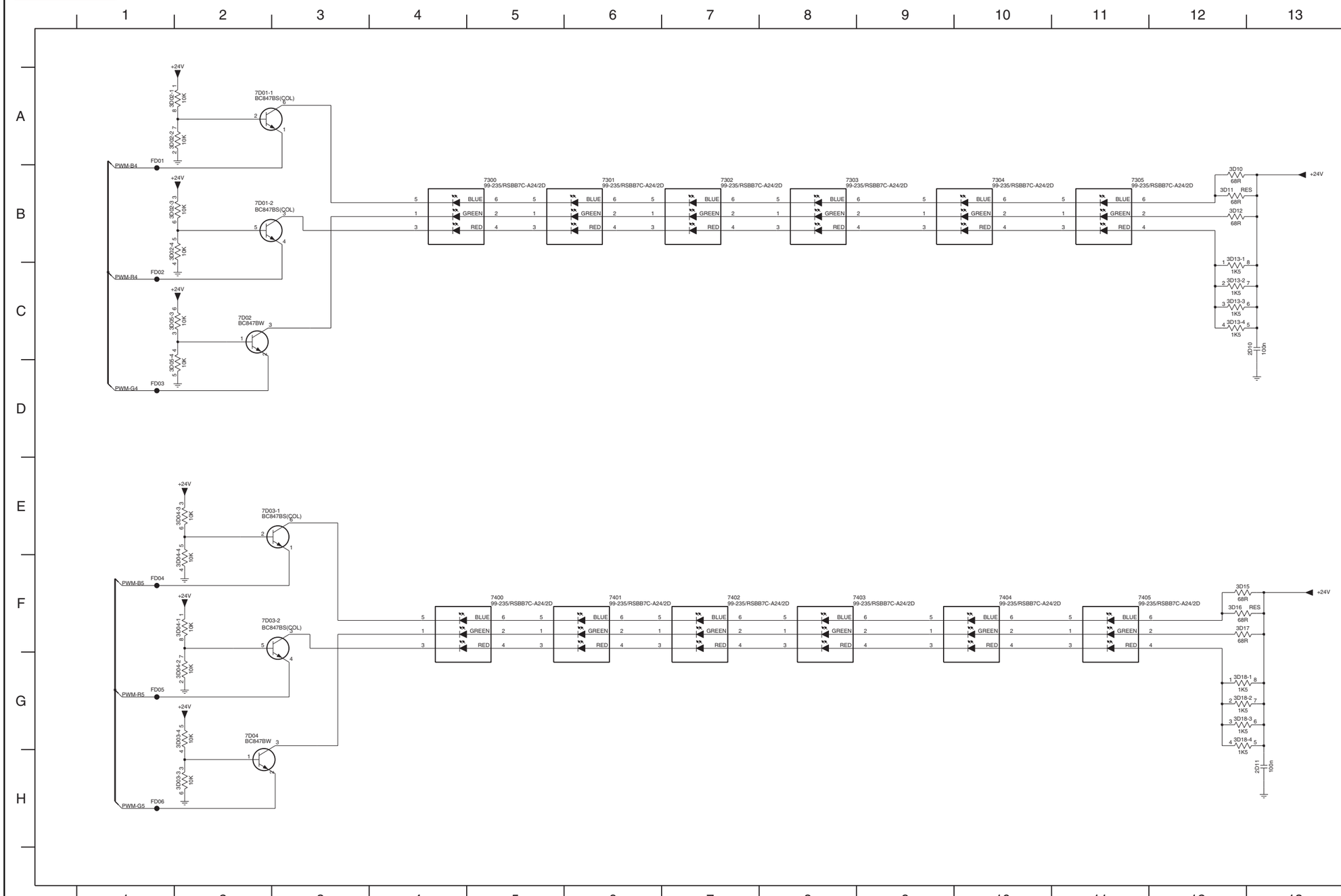
1 2009-11-27

18770_660_100212.eps
100219

15 LED Everlight

AL2B 15 LED Everlight

AL2B



2D10 C13
2D11 H13
3D02-1 A1
3D02-2 A1
3D02-3 B1
3D02-4 B1
3D03-3 H2
3D03-4 G2
3D04-1 F2
3D04-2 G2
3D04-3 E2
3D04-4 F2
3D05-3 C1
3D05-4 D1
3D10 B12
3D11 B12
3D12 B12
3D13-1 B12
3D13-2 C12
3D13-3 C12
3D13-4 C12
3D15 F12
3D16 F12
3D17 F12
3D18-1 G12
3D18-2 G12
3D18-3 G12
3D18-4 G12
7300 B5
7301 B6
7302 B7
7303 B8
7304 B10
7305 B11
7400 F5
7401 F6
7402 F7
7403 F8
7404 F10
7405 F11
7D01-1 A2
7D01-2 B2
7D02 C2
7D03-1 E2
7D03-2 F2
7D04 G2
FD01 A1
FD02 C1
FD03 D1
FD04 F1
FD05 G1
FD06 H1

15 LED Everlight AL 2K10	8204 000 9062 3104 313 64211	1 2009-11-27

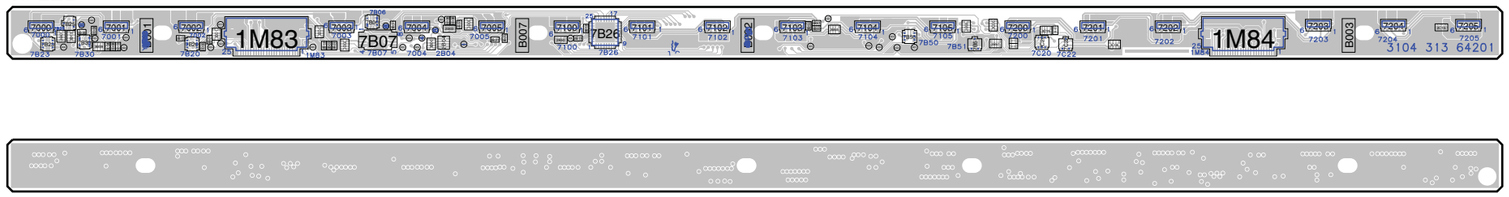
18770_661_100212.eps
100212

10-8 AL1 3104313 - 64201, 64191, 64211

Layout AmbiLight Everlight

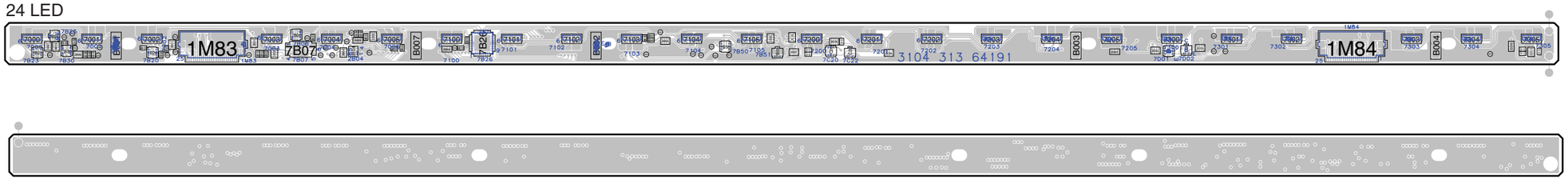
AmbiLight Everlight

18 LED



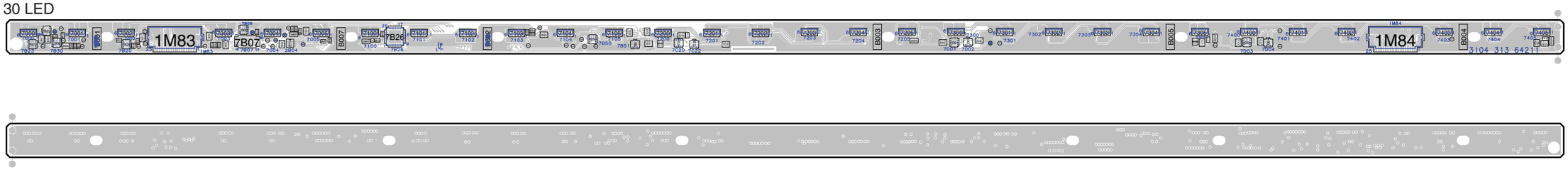
3104 313 6420.1

24 LED



3104 313 6419.1

30 LED



3104 313 6421.1

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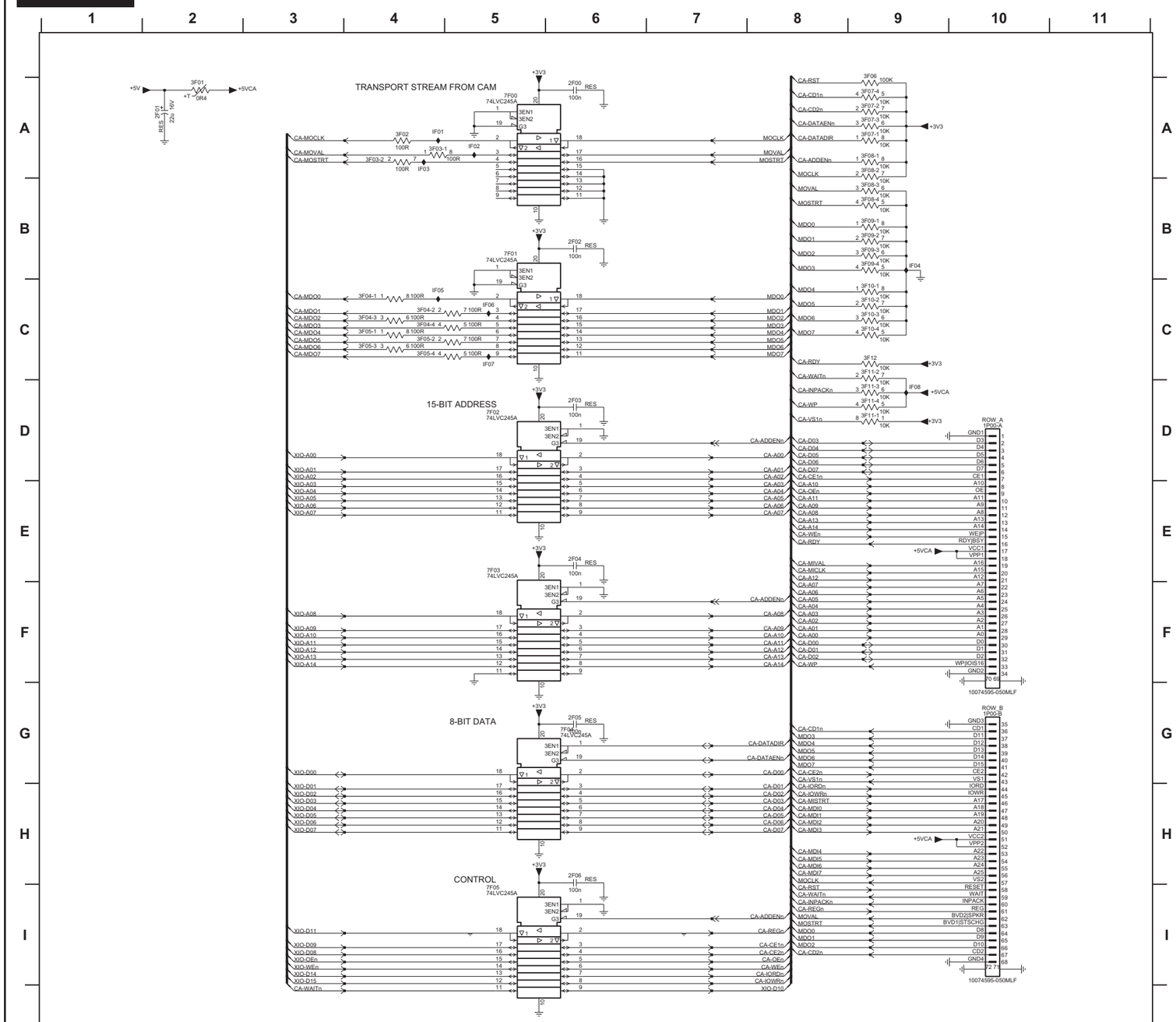
100325

10-9 B01 820400089943 Tuner, HDMI & CI

Common Interface

B01A Common Interface



1P00-A	D10
1P00-B	G10
2F00	A6
2F01	A2
2F02	B6
2F03	D6
2F04	E6
2F05	G6
2F06	H6
3F01	A2
3F02	A4
3F03-1	A4
3F03-2	A4
3F04-1	C4
3F04-2	C4
3F04-3	C4
3F04-4	C4
3F05-1	C4
3F05-2	C4
3F05-3	C4
3F05-4	C4
3F06	A9
3F07-1	A9
3F07-2	A9
3F07-3	A9
3F07-4	A9
3F08-1	A9
3F08-2	A9
3F08-3	B9
3F08-4	B9
3F09-1	B9
3F09-2	B9
3F09-3	B9
3F09-4	B9
3F10-1	C9
3F10-2	C9
3F10-3	C9
3F10-4	C9
3F11-1	D9
3F11-2	C9
3F11-3	D9
3F11-4	D9
3F12	C9
7F00	A5
7F01	B5
7F02	D5
7F03	E5
7F04	G5
7F05	I5
IF01	A4
IF02	A5
IF03	A4
IF04	B9
IF05	C4
IF06	C5
IF07	C5
IF08	D9

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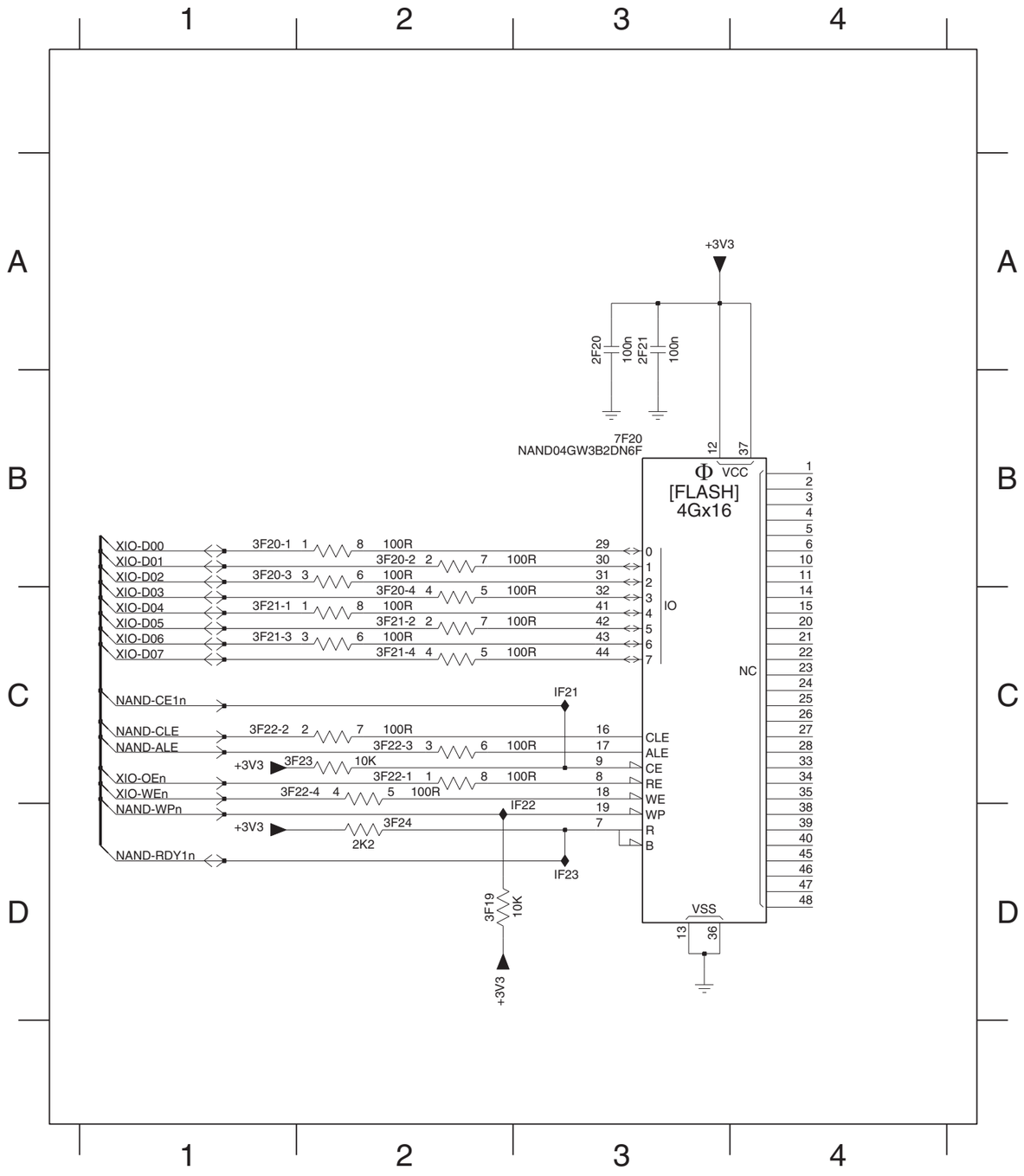
100218

Flash

B01B Flash

B01B



2F20 A3	3F20-1 B1	3F20-4 C2	3F21-3 C1	3F22-2 C1	3F23 C2	IF21 C3
2F21 A3	3F20-2 B2	3F21-1 C1	3F21-4 C2	3F22-3 C2	3F24 D2	IF22 D3
3F19 D2	3F20-3 B1	3F21-2 C2	3F22-1 C2	3F22-4 C2	7F20 B3	IF23 D3

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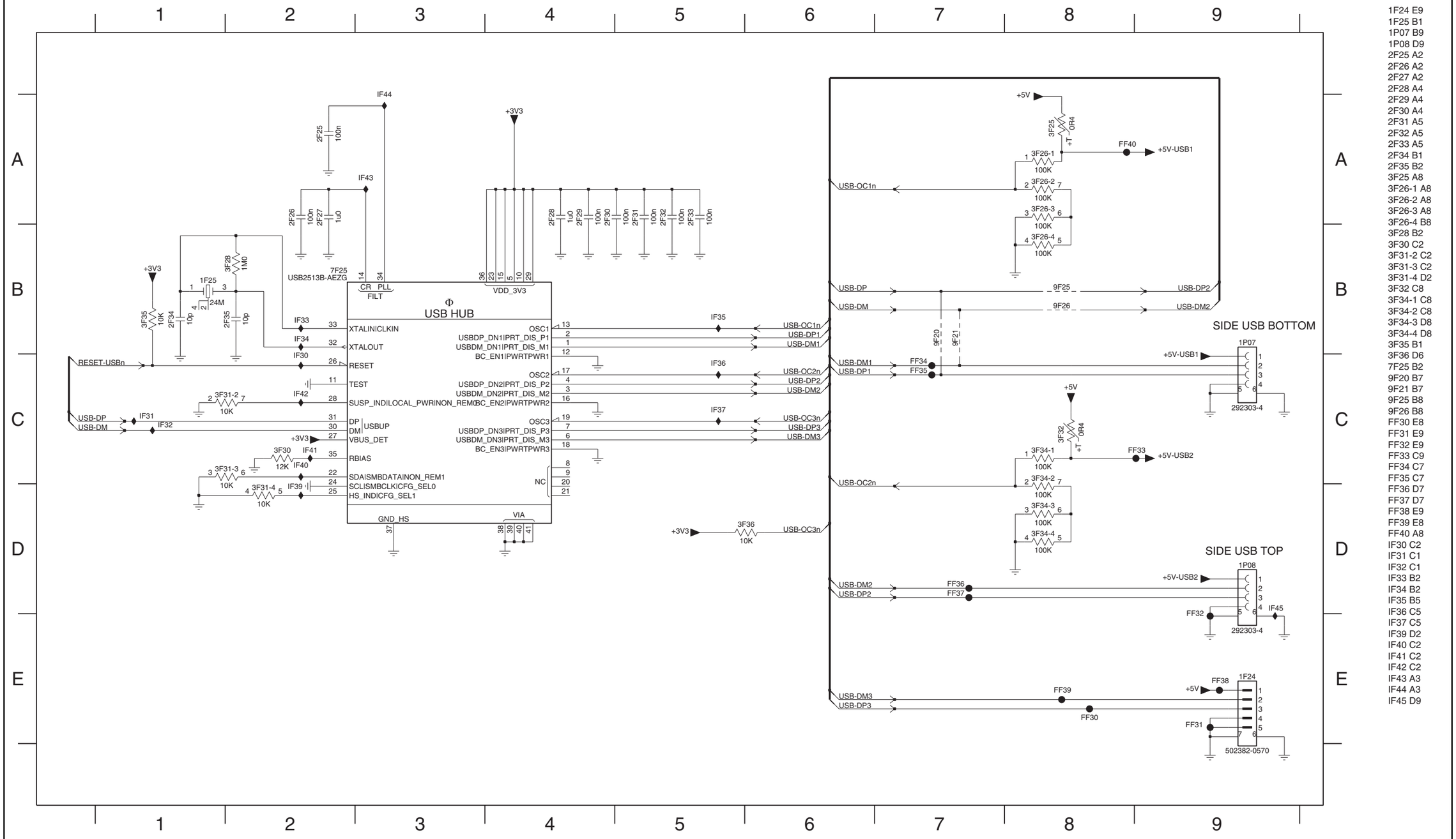
USB Hub

B01C USB Hub

B01C



1F24 E9
1F25 B1
1P07 B9
1P08 D9
2F25 A2
2F26 A2
2F27 A2
2F28 A4
2F29 A4
2F30 A4
2F31 A5
2F32 A5
2F33 A5
2F34 B1
2F35 B2
3F25 A8
3F26-1 A8
3F26-2 A8
3F26-3 A8
3F26-4 B8
3F28 B2
3F30 C2
3F31-2 C2
3F31-3 C2
3F31-4 D2
3F32 C8
3F34-1 C8
3F34-2 C8
3F34-3 D8
3F34-4 D8
3F35 B1
3F36 D6
7F25 B2
9F20 B7
9F21 B7
9F25 B8
9F26 B8
FF30 E8
FF31 E9
FF32 E9
FF33 C9
FF34 C7
FF35 C7
FF36 D7
FF37 D7
FF38 E9
FF39 E8
FF40 A8
IF30 C2
IF31 C1
IF32 C1
IF33 B2
IF34 B2
IF35 B5
IF36 C5
IF37 C5
IF39 D2
IF40 C2
IF41 C2
IF42 C2
IF43 A3
IF44 A3
IF45 D9

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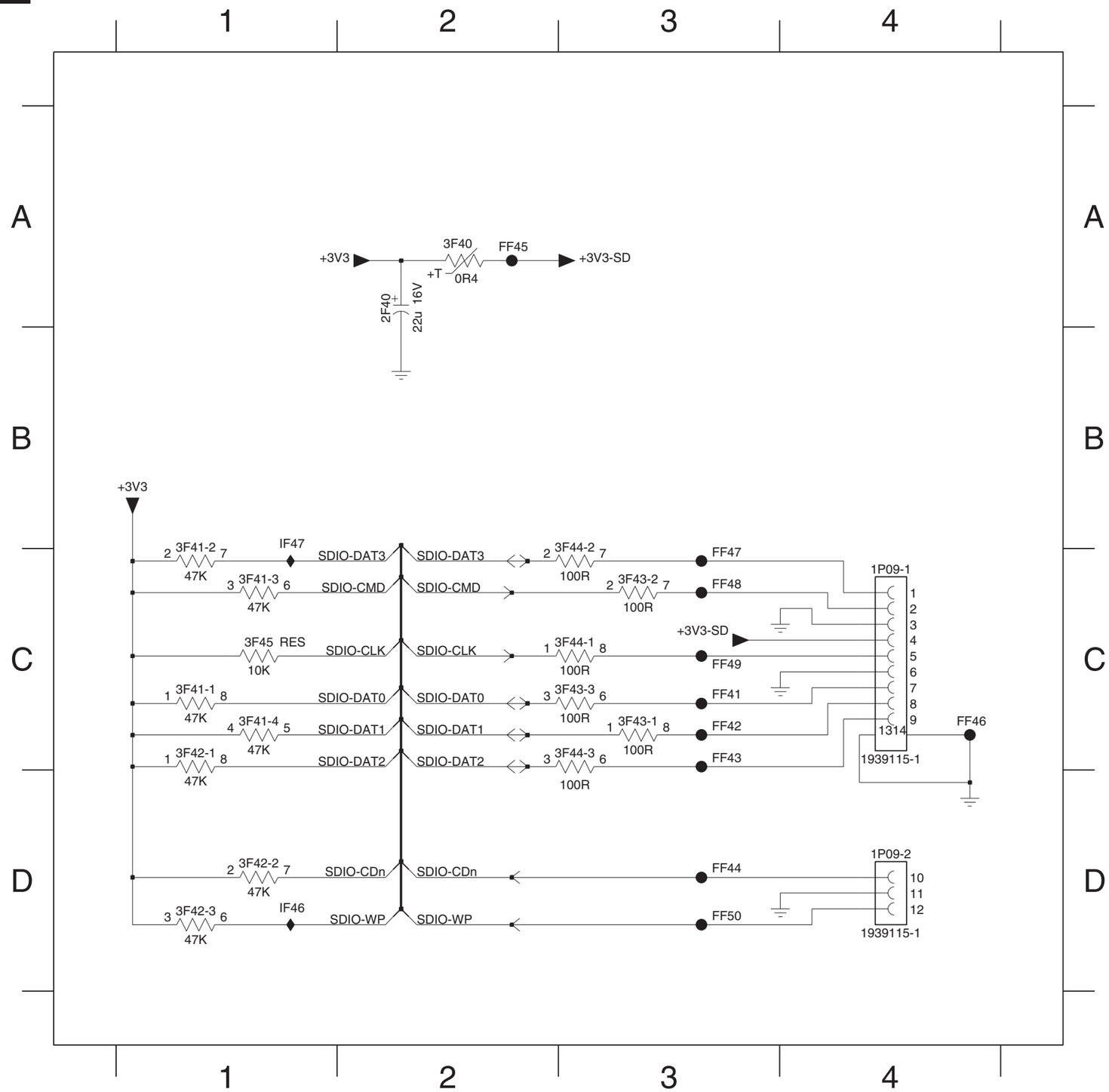
SD Card

B01D SD Card

B01D



1P09-1 C4
1P09-2 D4
2F40 A2
3F40 A2
3F41-1 C1
3F41-2 C1
3F41-3 C1
3F41-4 C1
3F42-1 C1
3F42-2 D1
3F42-3 D1
3F43-1 C3
3F43-2 C3
3F43-3 C3
3F44-1 C3
3F44-2 C3
3F44-3 C3
3F45 C1
FF41 C3
FF42 C3
FF43 C3
FF44 D3
FF45 A2
FF46 C4
FF47 C3
FF48 C3
FF49 C3
FF50 D3
IF46 D1
IF47 B1

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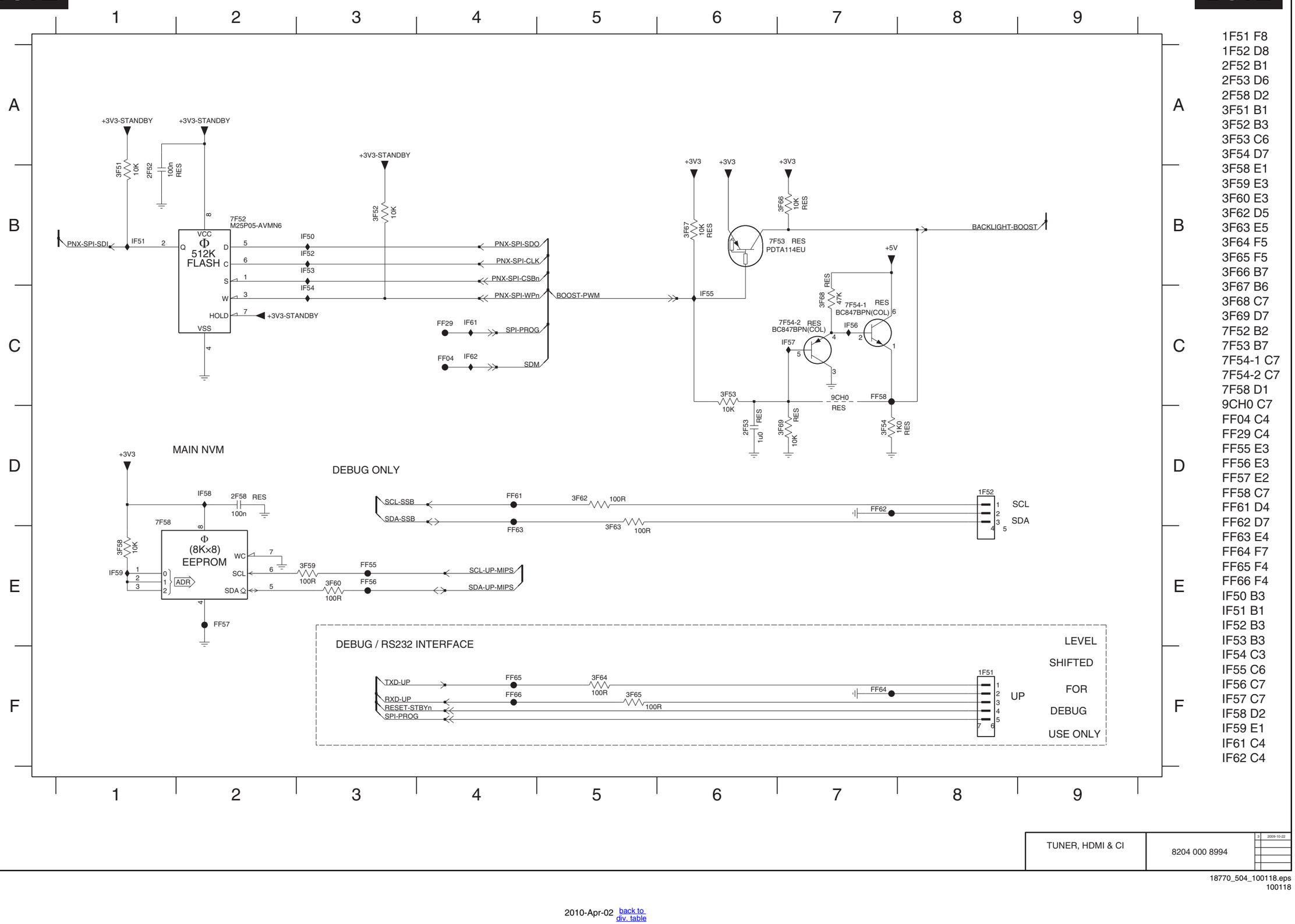
PNX85500 Control

B01E PNX85500 Control

B01E



1F51 F8
1F52 D8
2F52 B1
2F53 D6
2F58 D2
3F51 B1
3F52 B3
3F53 C6
3F54 D7
3F58 E1
3F59 E3
3F60 E3
3F62 D5
3F63 E5
3F64 F5
3F65 F5
3F66 B7
3F67 B6
3F68 C7
3F69 D7
7F52 B2
7F53 B7
7F54-1 C7
7F54-2 C7
7F58 D1
9CH0 C7
FF04 C4
FF29 C4
FF55 E3
FF56 E3
FF57 E2
FF58 C7
FF61 D4
FF62 D7
FF63 E4
FF64 F7
FF65 F4
FF66 F4
IF50 B3
IF51 B1
IF52 B3
IF53 B3
IF54 C3
IF55 C6
IF56 C7
IF57 C7
IF58 D2
IF59 E1
IF61 C4
IF62 C4

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HDMI & CI

B01F HDMI & CI

B01F

1F75 B5 1T01 A1 2F59 B1 2F60 B1 2F61 B1
2F62 B10 2F63 C9 2F64 C9 2F65 B10 2F66 C10
2F70 B10 2F71 A7 2F72 A9 2F73 A9 2F74 B6
2F75 B8 2F76 B9 2F77 B9 2F78 B6 2F79 B8
2F80 B9 2F81 B1 2F82 B9 2F84 C1 2F85 C4
2F86 D1 2F88 E5 2F90 C6 2F91 D6 2F92 C7
2F93 C2 2F94 D7 3F71 C7 3F72 C7 3F75 D2
3F76 C2 3F77 C4 3F78 C7 3F79-1 B8 3F79-4 B8
3F80 C9 3F81 C9 3F82 B10 5F66 C10 5F70 D6
5F71 B9 5F72 E4 5F73 C5 5F74 B10 5F76 B10
6F72 C7 7F70 D8 7F75 A6 9F00 A6 9F01 A6
9F02 A8 9F03 A8 9F04 A8 9F05 A6 9F06 C4
9F71 E4 AF70 B3 AF71 B3 AF72 B9 AF73 B9
FF00 B2 FF01 C4 FF71 A1 FF74 B1 FF75 B2
FF76 B1 FF81 C1 FF82 C2 IF10 A5 IF11 A5
IF12 C9 IF13 C9 IF14 C9 IF15 C9 IF16 B10
IF72 C5 IF73 B6 IF74 B8 IF75 B6 IF76 B8
IF77 B6 IF78 B8 IF79 B8 IF80 B8 IF81 B6
IF82 C4 IF86 C5 IF87 C2 IF88 D2 IF89 D5
IF90 D7

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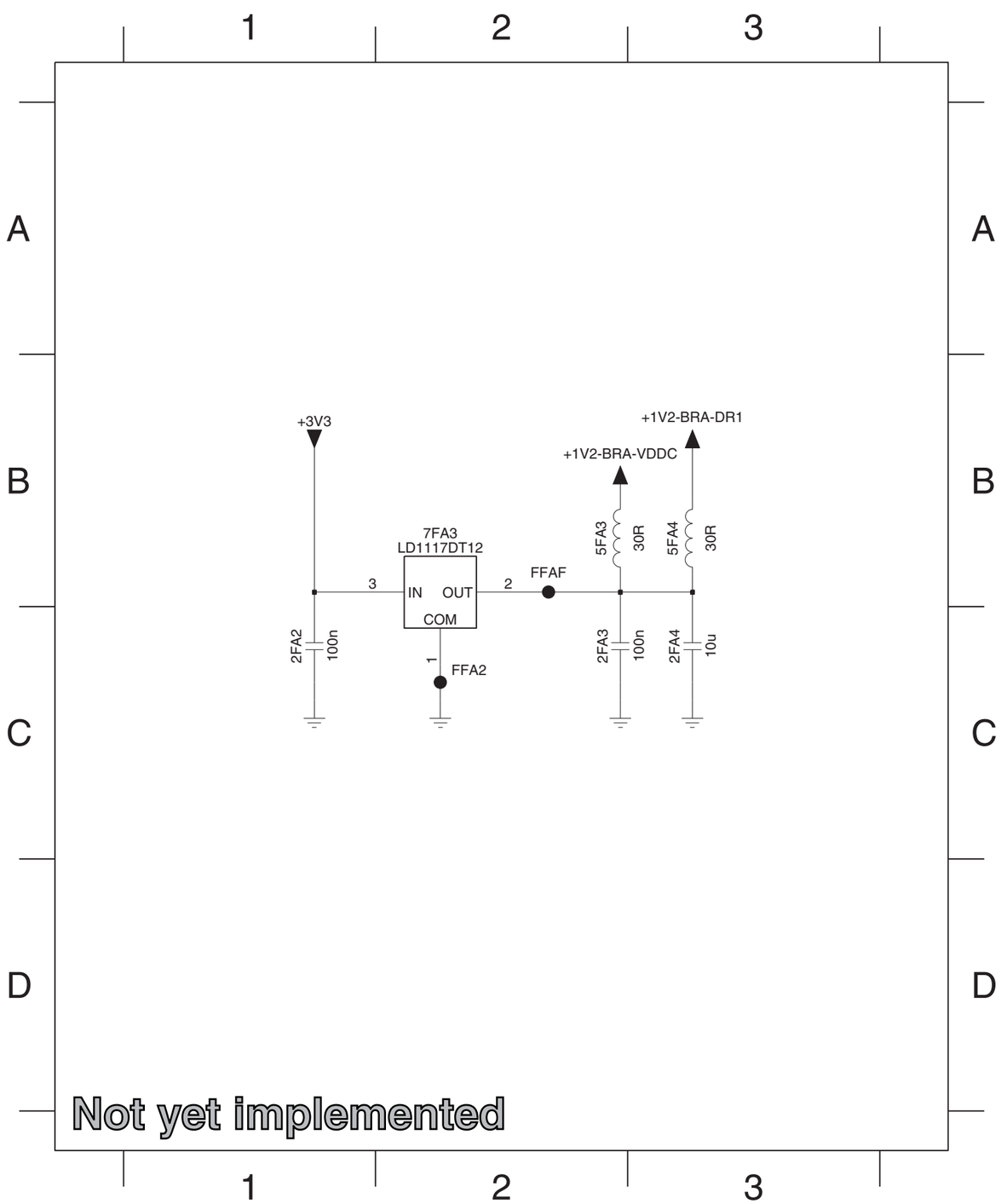
Toshiba Supply

B01G Toshiba Supply

B01G



2FA2 C1
2FA3 C2
2FA4 C3
5FA3 B2
5FA4 B3
7FA3 B2
FFA2 C2
FFAF B2

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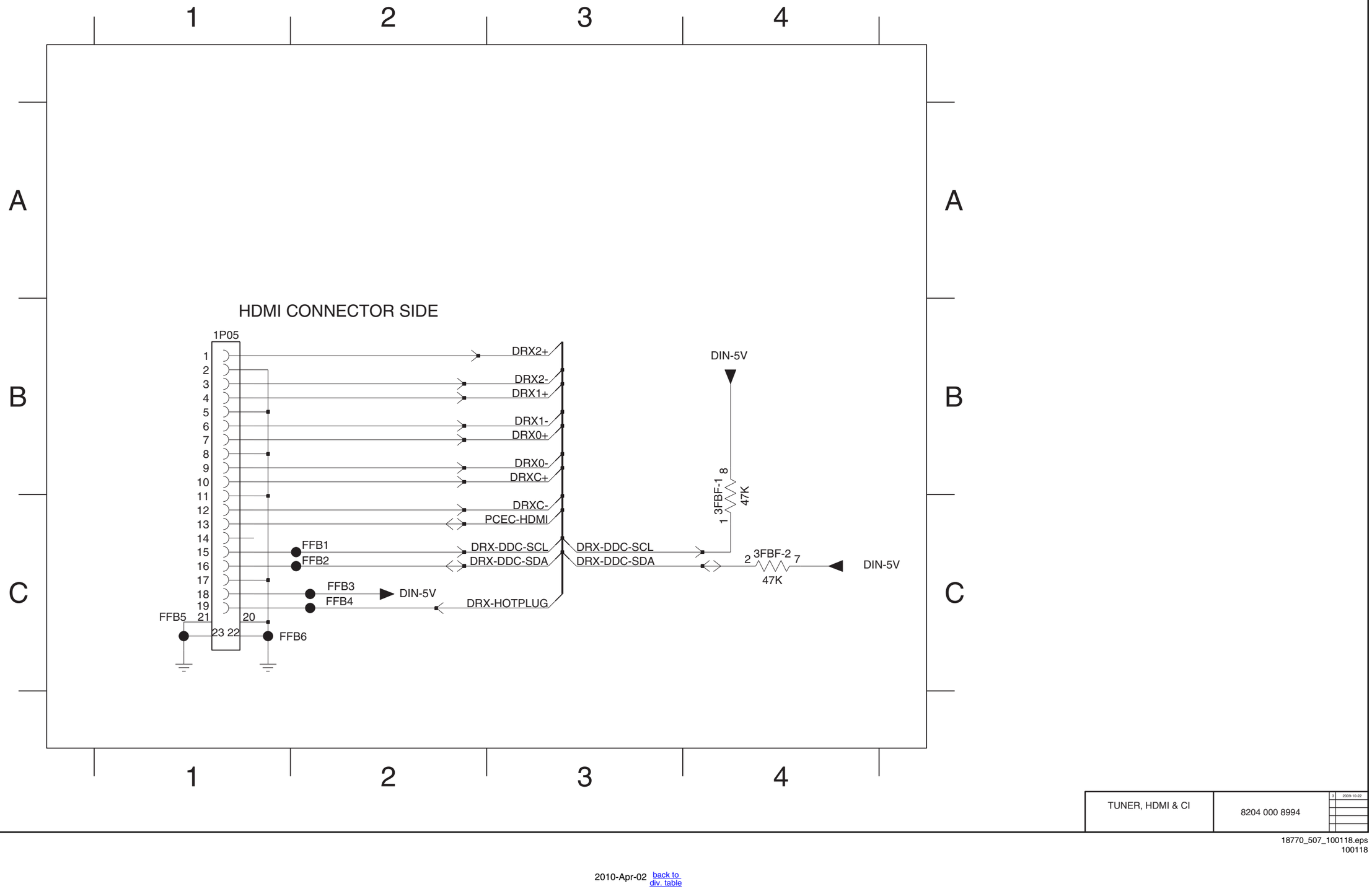
100118

HDMI

B01H HDMI **B01H**

1P05 B1 3FBF-1 C4 3FBF-2 C4 FFB1 C2 FFB2 C2 FFB3 C2 FFB4 C2 FFB5 C1 FFB6 C2



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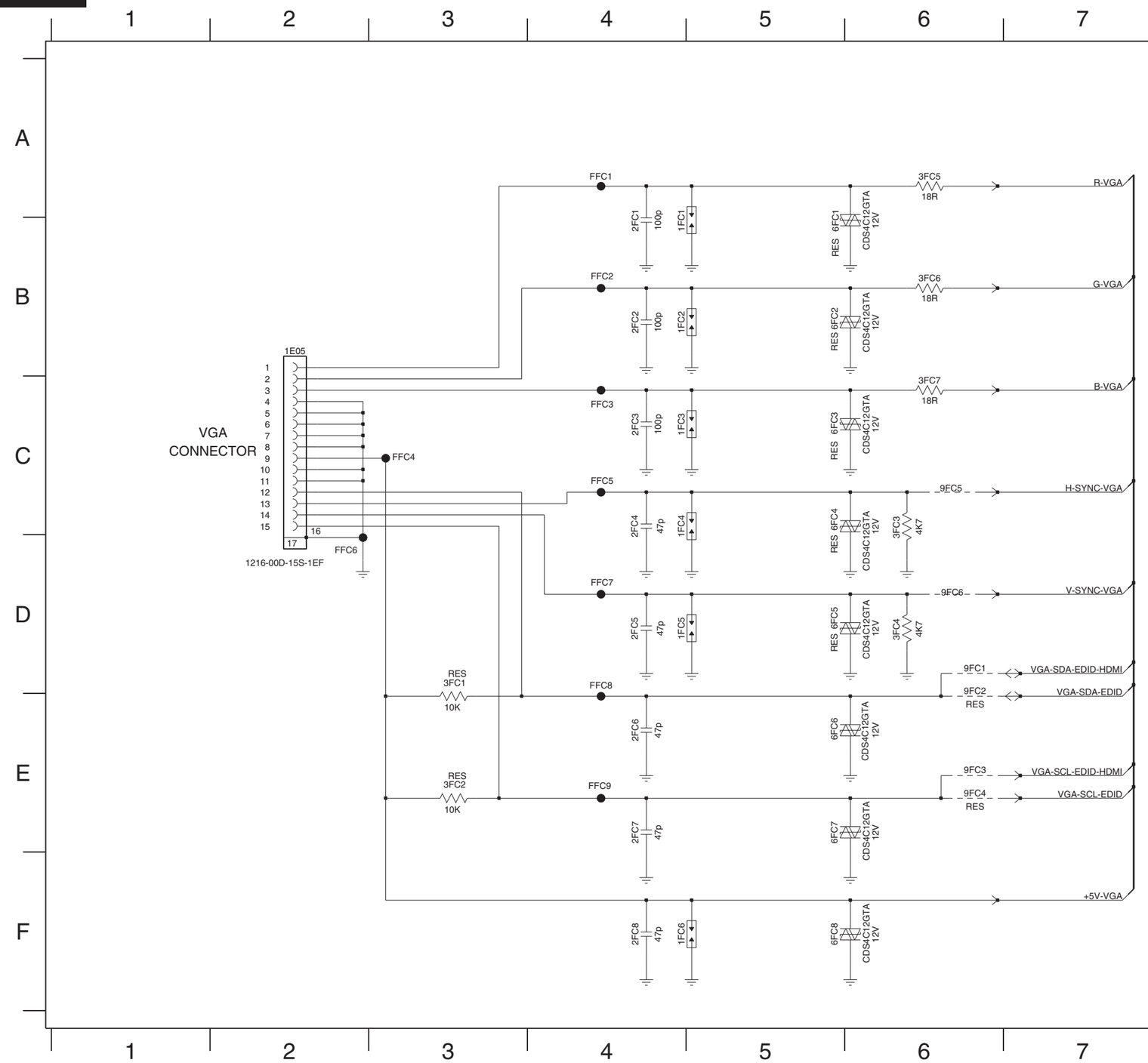
100118

VGA

B01I VGA



B01I

1E05 B2
1FC1 B4
1FC2 B4
1FC3 C4
1FC4 C4
1FC5 D4
1FC6 F4
2FC1 B4
2FC2 B4
2FC3 C4
2FC4 C4
2FC5 D4
2FC6 E4
2FC7 E4
2FC8 F4
3FC1 D3
3FC2 E3
3FC3 C6
3FC4 D6
3FC5 A6
3FC6 B6
3FC7 C6
6FC1 B5
6FC2 B5
6FC3 C5
6FC4 C5
6FC5 D5
6FC6 E5
6FC7 E5
6FC8 F5
9FC1 D6
9FC2 E6
9FC3 E6
9FC4 E6
9FC5 C6
9FC6 D6
FFC1 A4
FFC2 B4
FFC3 C4
FFC4 C3
FFC5 C4
FFC6 D2
FFC7 D4
FFC8 D4
FFC9 E4

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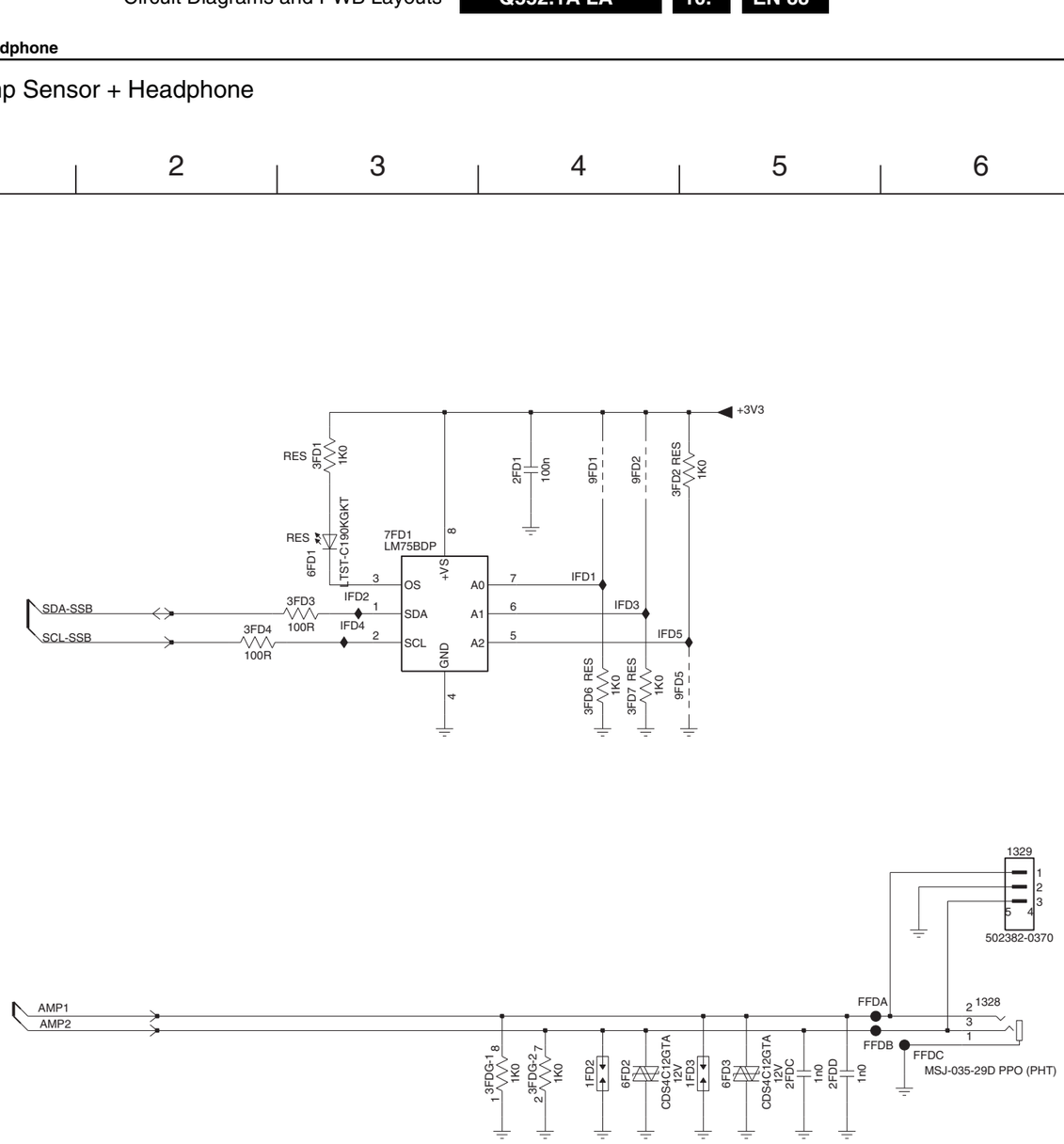
100118

Temp Sensor + Headphone

B01J Temp Sensor + Headphone

B01J



1328 D6
1329 C6
1FD2 D4
1FD3 D5
2FD1 A4
2FDC D5
2FDD D5
3FD1 A3
3FD2 B5
3FD3 B3
3FD4 B2
3FD6 C4
3FD7 C4
3FDG-1 D4
3FDG-2 D4
6FD1 B3
6FD2 D4
6FD3 D5
7FD1 B3
9FD1 A4
9FD2 A4
9FD5 C5
FFDA D5
FFDB D5
FFDC D6
IFD1 B4
IFD2 B3
IFD3 B4
IFD4 B3
IFD5 B4

TUNER, HDMI & CI	8204 000 8994	3 2009-10-22

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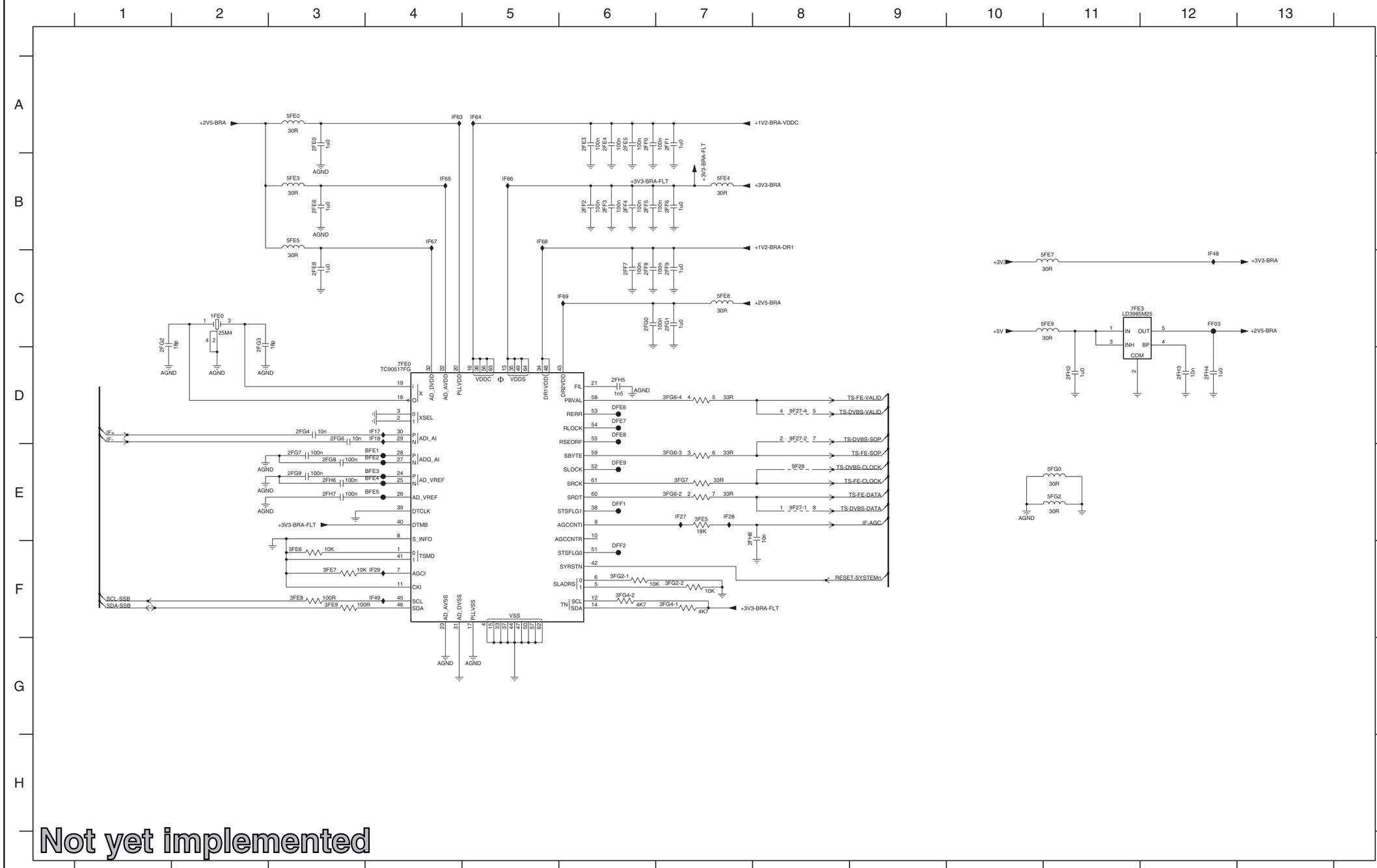
Tuner Brazil

B01K Tuner Brazil

B01K



Not yet implemented

1FE0 C2
2FE0 A3
2FE3 A6
2FE4 A6
2FE5 A6
2FE6 B3
2FE8 C3
2FF0 A6
2FF1 A7
2FF2 B6
2FF3 B6
2FF4 B6
2FF5 B6
2FF6 B7
2FF7 C6
2FF8 C6
2FF9 C7
2FG0 C6
2FG1 C7
2FG2 C1
2FG3 C2
2FG4 D3
2FG6 D3
2FG7 E3
2FG8 E3
2FG9 E3
2FH2 D11
2FH3 D12
2FH4 D12
2FH5 D6
2FH6 E3
2FH7 E3
2FH8 E7
3FE5 E7
3FE6 F3
3FE7 F3
3FE8 F3
3FE9 F3
3FG2-1 F6
3FG2-2 F7
3FG4-1 F7
3FG4-2 F6
3FG6-2 E7
3FG6-3 E7
3FG6-4 D7
3FG7 E7
5FE0 A3
5FE3 B3
5FE4 B7
5FE5 B3
5FE7 C11
5FE8 C7
5FE9 C11
5FG0 E11
5FG2 E11
7FE0 D4
7FE3 C11
9F27-1 E8
9F27-2 D8
9F27-4 D8
9F28 E8
BFE1 E4
BFE2 E4
BFE3 E4
BFE4 E4
BFE5 E4
DFE6 D6
DFE7 D6
DFE8 D6
DFE9 E6
DFF1 E6
DFF2 F6
FF03 C12
IF17 D4
IF18 D4
IF27 E7
IF28 E7
IF29 F4
IF48 C12
IF49 F4
IF63 A4
IF64 A5
IF65 B4
IF66 B5
IF67 B4
IF68 B5
IF69 C6

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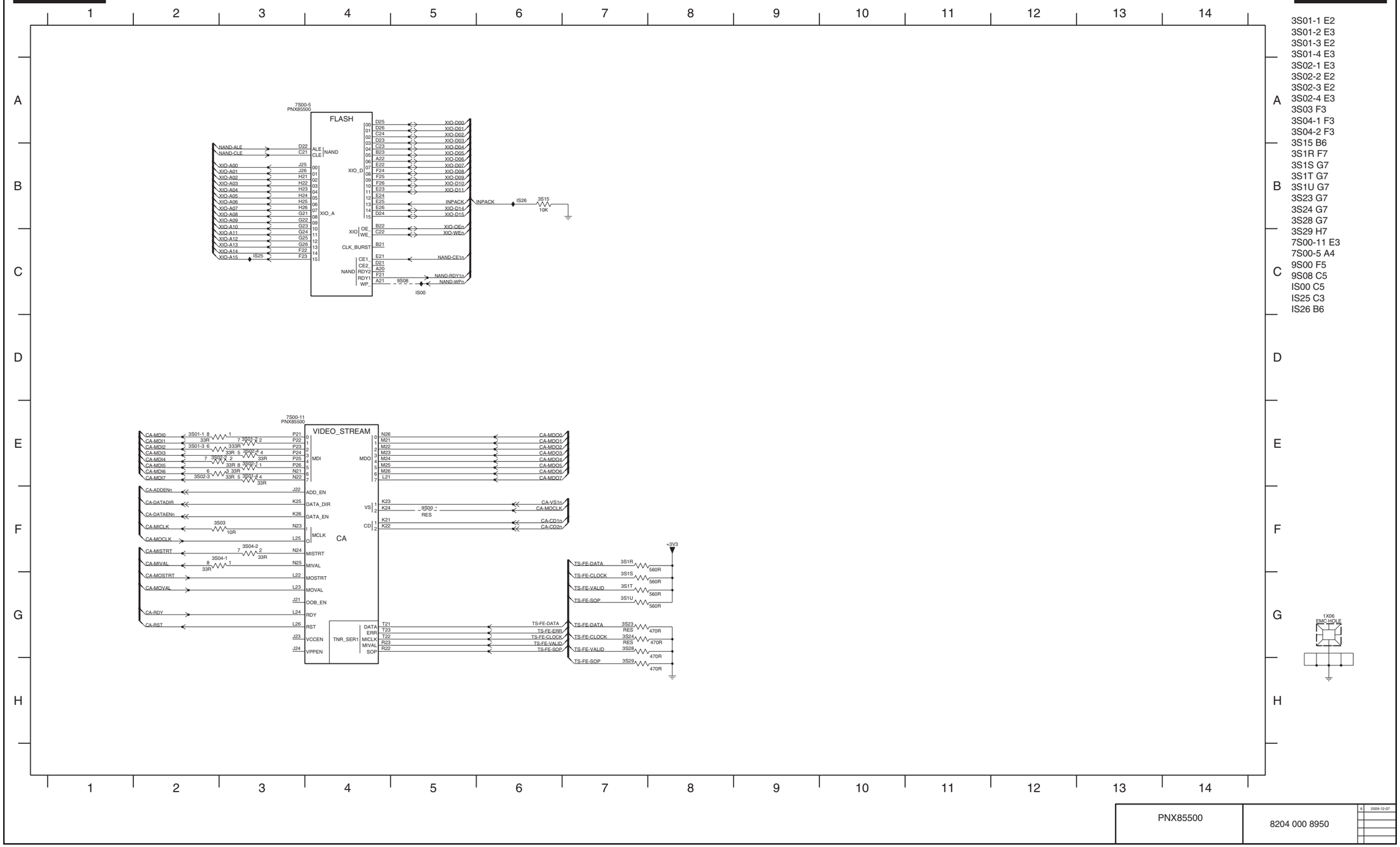
10-10 B02 820400089506 PNX85500

PNX NandFlash - Conditional Access

B02A PNX NandFlash - Conditional Access

B02A



3S01-1 E2
3S01-2 E3
3S01-3 E2
3S01-4 E3
3S02-1 E3
3S02-2 E2
3S02-3 E2
3S02-4 E3
3S03 F3
3S04-1 F3
3S04-2 F3
3S15 B6
3S1R F7
3S1S G7
3S1T G7
3S1U G7
3S23 G7
3S24 G7
3S28 G7
3S29 H7
7S00-11 E3
7S00-5 A4
9S00 F5
9S08 C5
IS00 C5
IS25 C3
IS26 B6

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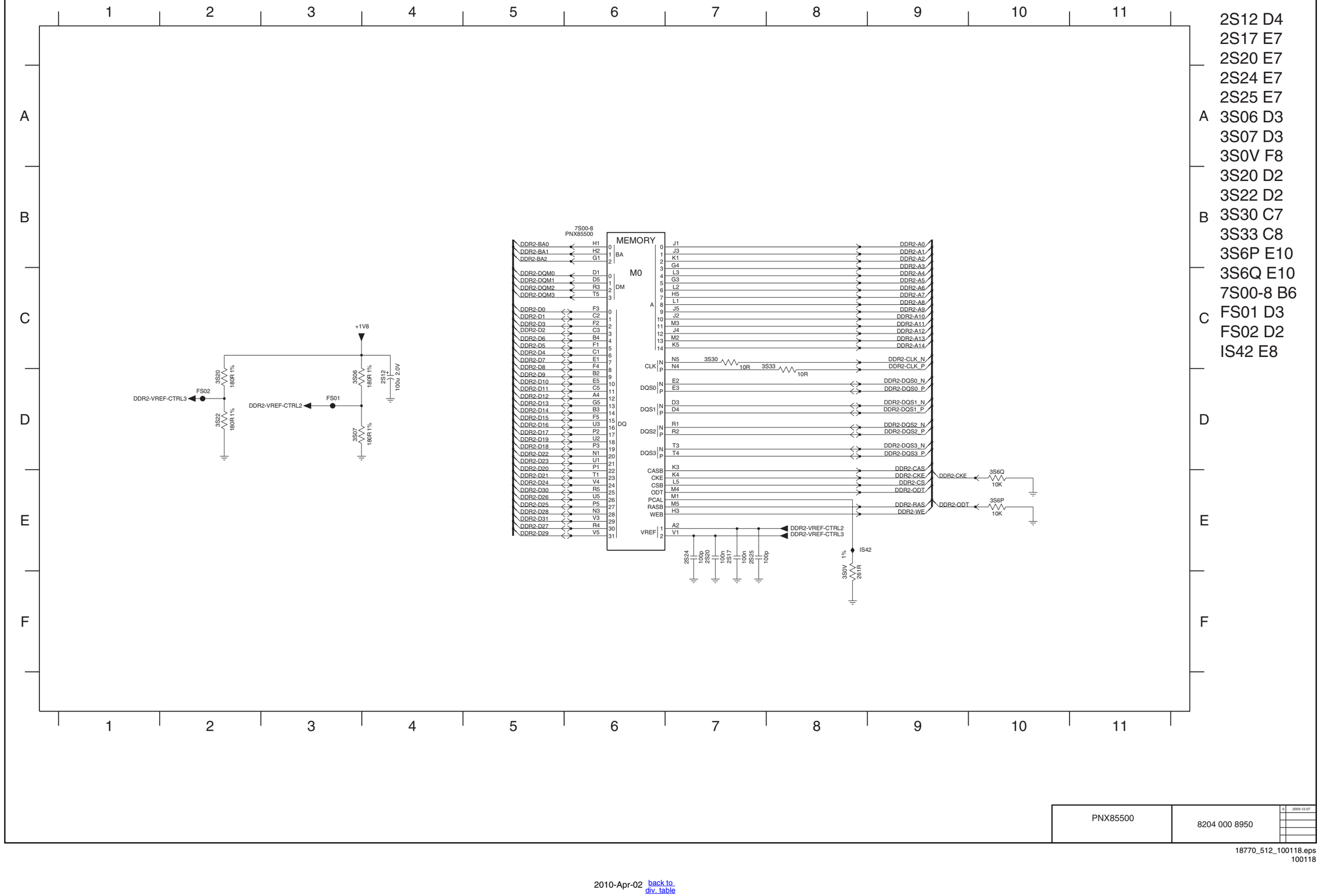
PNX SDRAM

B02B PNX SDRAM

B02B


1 2 3 4 5 6 7 8 9 10 11
A B C D E F
7S00-8
PNX85500
MEMORY
M0
BA
DM
DQ
DDR2-BA0 DDR2-BA1 DDR2-BA2
DDR2-DQM0 DDR2-DQM1 DDR2-DQM2 DDR2-DQM3
DDR2-D0 DDR2-D1 DDR2-D2 DDR2-D3 DDR2-D4 DDR2-D5 DDR2-D6 DDR2-D7 DDR2-D8 DDR2-D9 DDR2-D10 DDR2-D11 DDR2-D12 DDR2-D13 DDR2-D14 DDR2-D15 DDR2-D16 DDR2-D17 DDR2-D18 DDR2-D19 DDR2-D20 DDR2-D21 DDR2-D22 DDR2-D23 DDR2-D24 DDR2-D25 DDR2-D26 DDR2-D27 DDR2-D28 DDR2-D29 DDR2-D30 DDR2-D31
DDR2-A0 DDR2-A1 DDR2-A2 DDR2-A3 DDR2-A4 DDR2-A5 DDR2-A6 DDR2-A7 DDR2-A8 DDR2-A9 DDR2-A10 DDR2-A11 DDR2-A12 DDR2-A13 DDR2-A14
CLK DQS0 DQS1 DQS2 DQS3
DDR2-CLK_N DDR2-CLK_P
DDR2-DQS0_N DDR2-DQS0_P
DDR2-DQS1_N DDR2-DQS1_P
DDR2-DQS2_N DDR2-DQS2_P
DDR2-DQS3_N DDR2-DQS3_P
3S30 10R 3S33 10R
CASB CKE CSB ODT PCAL RASB WEB
DDR2-CAS DDR2-CKE DDR2-CS DDR2-ODT DDR2-RAS DDR2-WE
DDR2-CKE 3S6Q 10K
DDR2-ODT 3S6P 10K
VREF
DDR2-VREF-CTRL2 DDR2-VREF-CTRL3
2S24 100p 2S20 100n 2S17 100n 2S25 100p
IS42
3S0V 1% 261R
+1V8
3S20 180R 1%
3S06 180R 1%
2S12 100u 2.0V
3S22 180R 1%
3S07 180R 1%
FS02 DDR2-VREF-CTRL3
FS01 DDR2-VREF-CTRL2

2S12 D4
2S17 E7
2S20 E7
2S24 E7
2S25 E7
3S06 D3
3S07 D3
3S0V F8
3S20 D2
3S22 D2
3S30 C7
3S33 C8
3S6P E10
3S6Q E10
7S00-8 B6
FS01 D3
FS02 D2
IS42 E8

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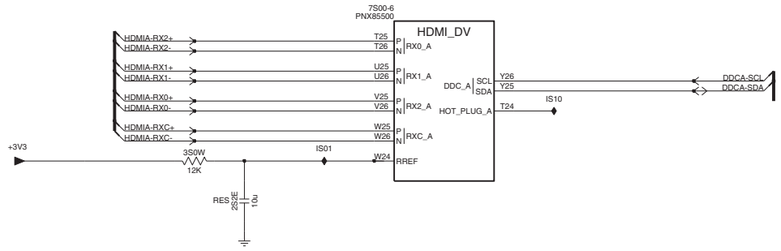
PNX Digital Video In

B02C PNX Digital Video In

B02C

2S2E F5
3S0W E5
7S00-6 D6
IS01 E6
IS10 E7



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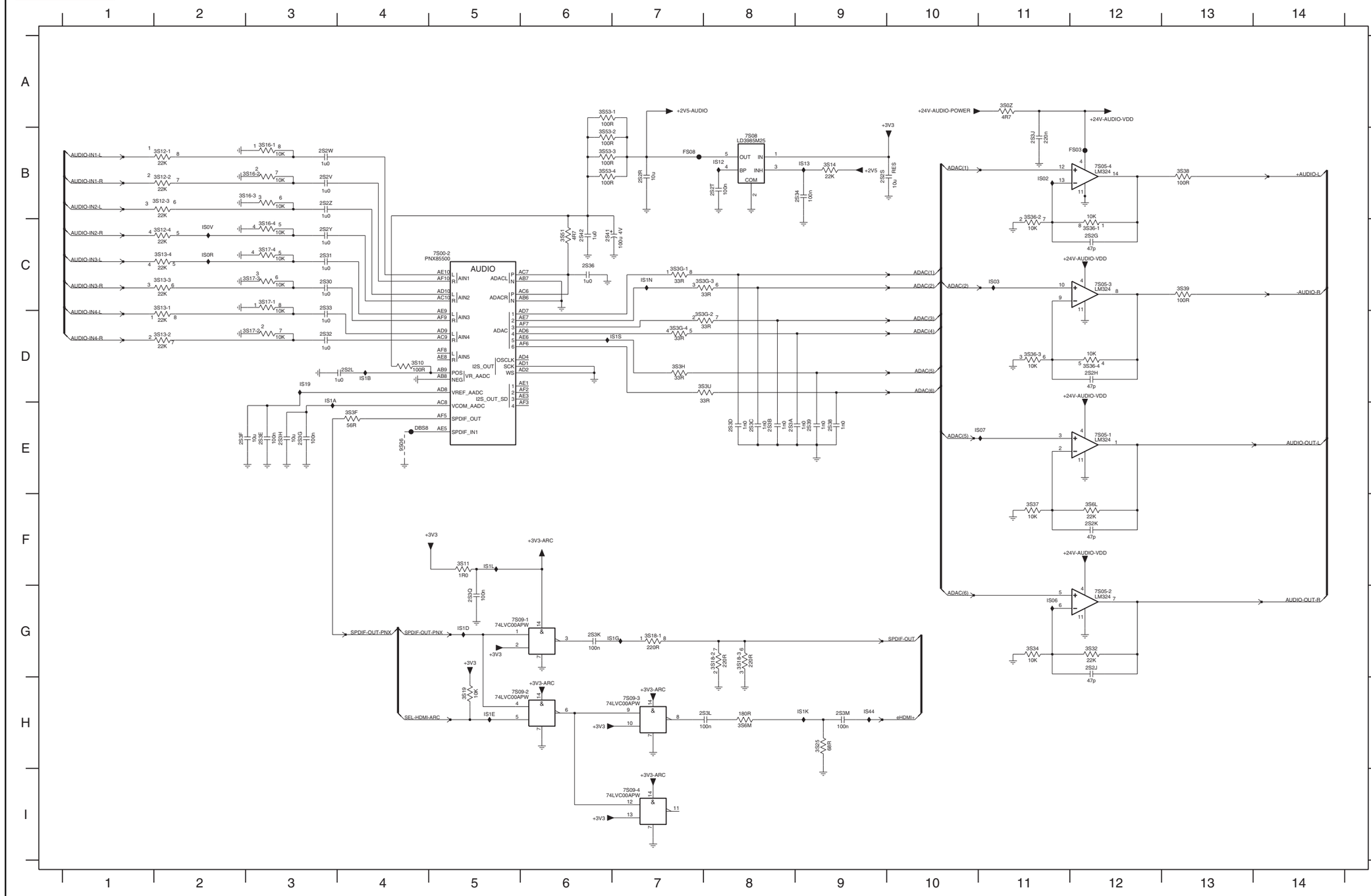
PNX Audio

B02D PNX Audio

B02D



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2S2H D12 IS1K H9
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2S2L D4 IS1S D7
2S2R B7 IS44 H9
2S2S B9
2S2T B8
2S2V B3
2S2W B3
2S2Y C3
2S2Z B3
2S30 C3
2S31 C3
2S32 D3
2S33 C3
2S34 B9
2S36 C6
2S38 E9
2S39 E9
2S3A E8
2S3B E8
2S3C E8
2S3D E8
2S3E E3
2S3F E2
2S3G E3
2S3H E3
2S3J B11
2S3K G6
2S3L H8
2S3M H9
2S3Q G5
2S41 C6
2S42 C6
3S0Z A11
3S10 D4
3S11 F5
3S12-1 B2
3S12-2 B2
3S12-3 B2
3S12-4 C2
3S13-1 C2
3S13-2 D2
3S13-3 C2
3S13-4 C2
3S14 B9
3S16-1 B3
3S16-2 B3
3S16-3 B3
3S16-4 C3
3S17-1 C3
3S17-2 D3
3S17-3 C3
3S17-4 C3
3S18-1 G7
3S18-2 G8
3S18-3 G8
3S19 H5
3S25 H9
3S32 G12
3S34 G11
3S36-1 C12
3S36-2 B11
3S36-3 D11
3S36-4 D12
3S37 F11
3S38 B13
3S39 C13
3S3F E4
3S3G-1 C7
3S3G-2 D8
3S3G-3 C8
3S3G-4 D7
3S3H D7
3S3U D8
3S51 C6
3S53-1 A6
3S53-2 B6
3S53-3 B6
3S53-4 B6
3S6L F12
3S6M H8
7S00-2 C5
7S05-1 E12
7S05-2 G12
7S05-3 C12
7S05-4 B12
7S08 B8
7S09-1 G6
7S09-2 H6
7S09-3 H7
7S09-4 I7
9S06 E4
DBS8 E4
FS03 B12
FS08 B7
IS02 B11
IS03 C11
IS06 G11
IS07 E11
IS0R C2
IS0V C2
IS12 B8
IS13 B9
IS19 D3
IS1A D3
IS1B D4
IS1D G5
IS1E H5

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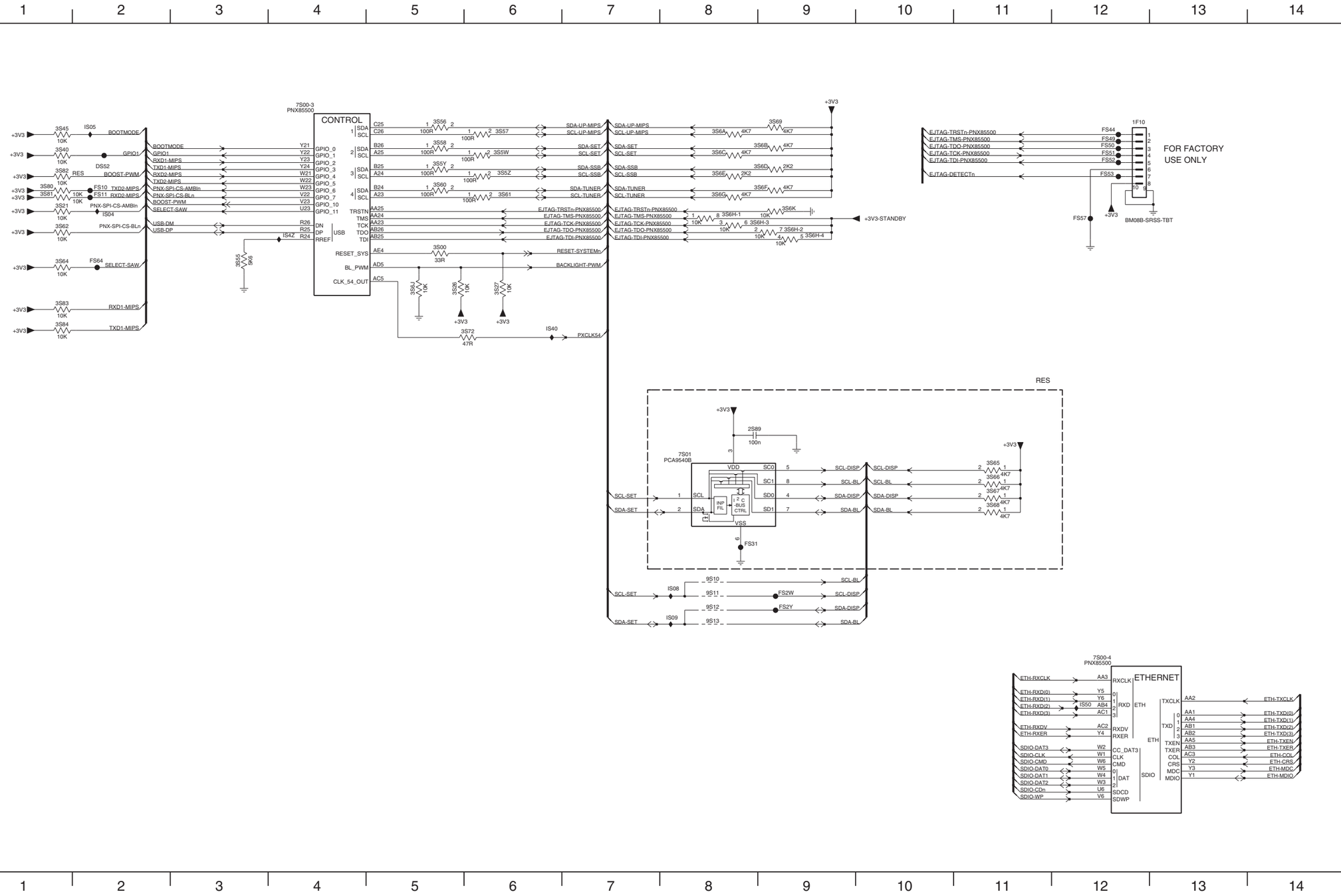
PNX Mips

B02E PNX Mips

B02E



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2S89 D8
3S00 B5
3S21 B1
3S26 C5
3S27 C6
3S40 A1
3S45 A1
3S55 C3
3S56 A5
3S57 A6
3S58 A5
3S5W B6
3S5Y B5
3S5Z B6
3S60 B5
3S61 B6
3S62 B1
3S64 C1
3S65 E11
3S66 E11
3S67 E11
3S68 E11
3S69 A9
3S6A A8
3S6B A9
3S6C B8
3S6D B9
3S6E B8
3S6F B9
3S6G B8
3S6H-1 B8
3S6H-2 B9
3S6H-3 B9
3S6H-4 B9
3S6J C5
3S6K B9
3S72 C6
3S80 B1
3S81 B1
3S82 B1
3S83 C1
3S84 C1
7S00-3 A4
7S00-4 G12
7S01 E8
9S10 F8
9S11 F8
9S12 F8
9S13 F8
DS52 B2
FS10 B2
FS11 B2
FS2W F9
FS2Y F9
FS31 F8
FS44 A12
FS49 A12
FS50 A12
FS51 B12
FS52 B12
FS53 B12
FS57 B12
FS64 C2
IS04 B2
IS05 A2
IS08 F8
IS09 F8
IS40 C6
IS4Z B4
IS50 G12

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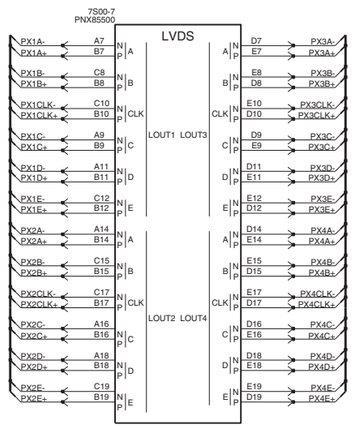
PNX Video Out - LVDS

B02F PNX Video Out - LVDS

B02F

7S00-7 C8



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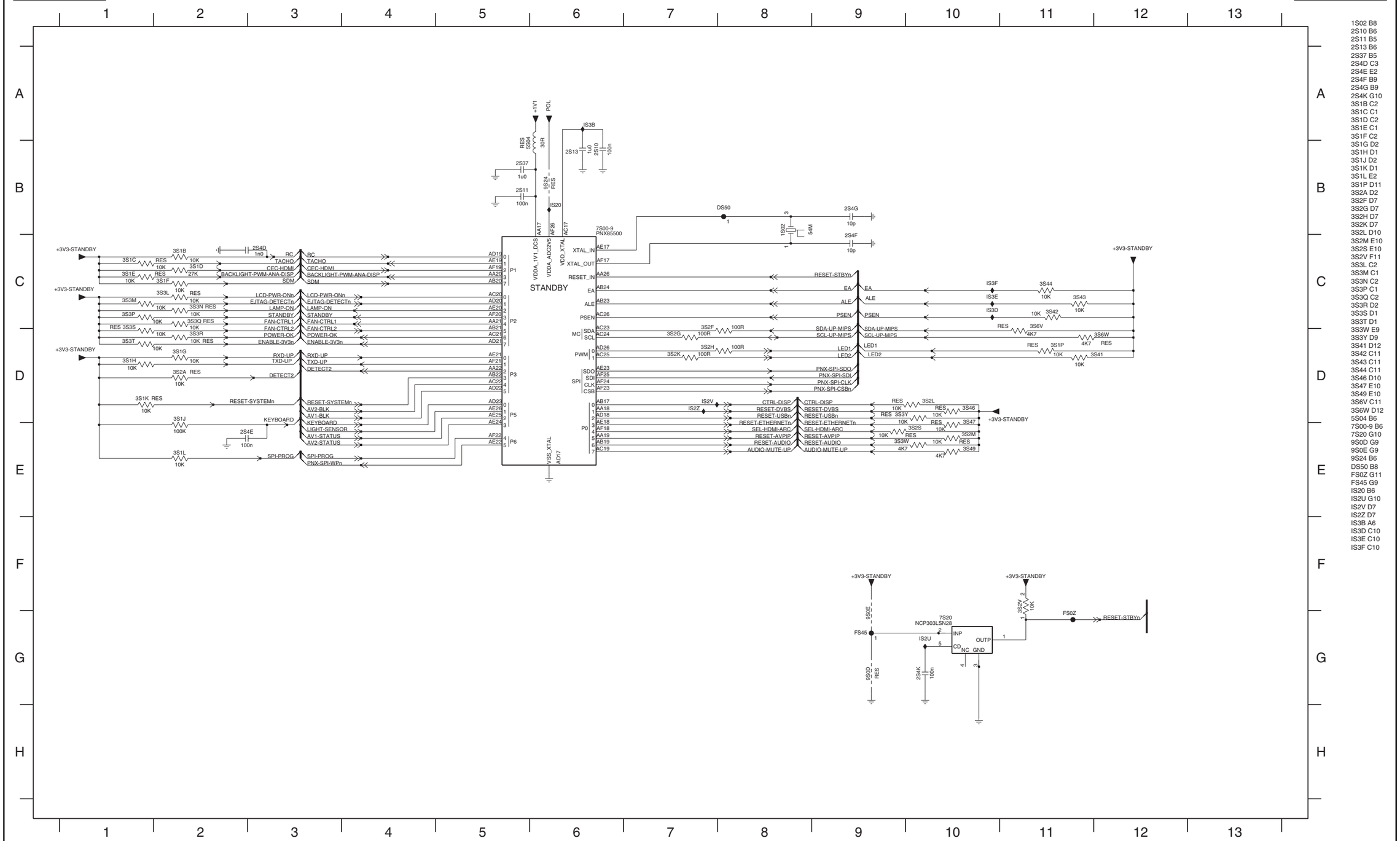
PNX Stand-by Controller

B02G PNX Stand-by Controller

B02G



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2S10 B6
2S11 B5
2S13 B6
2S37 B5
2S4D C3
2S4E E2
2S4F B9
2S4G B9
2S4K G10
3S1B C2
3S1C C1
3S1D C2
3S1E C1
3S1F C2
3S1G D2
3S1H D1
3S1J D2
3S1K D1
3S1L E2
3S1P D11
3S2A D2
3S2F D7
3S2G D7
3S2H D7
3S2K D7
3S2L D10
3S2M E10
3S2S E10
3S2V F11
3S3L C2
3S3M C1
3S3N C2
3S3P C1
3S3Q C2
3S3R D2
3S3S D1
3S3T D1
3S3W E9
3S3Y D9
3S41 D12
3S42 C11
3S43 C11
3S44 C11
3S46 D10
3S47 E10
3S49 E10
3S6V C11
3S6W D12
5S04 B6
7S00-9 B6
7S20 G10
9S0D G9
9S0E G9
9S24 B6
DS50 B8
FS0Z G11
FS45 G9
IS20 B6
IS2U G10
IS2V D7
IS2Z D7
IS3B A6
IS3D C10
IS3E C10
IS3F C10

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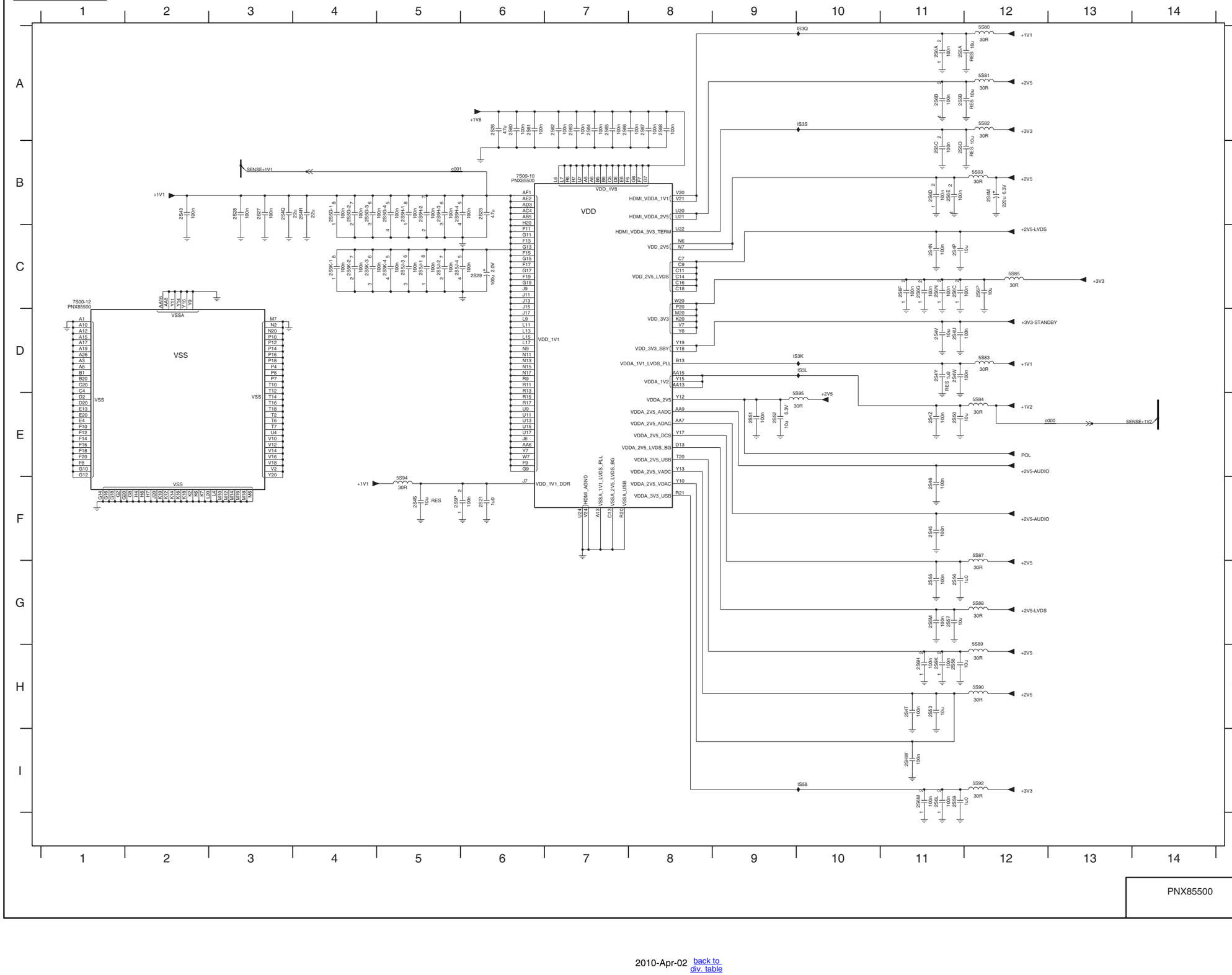
PNX Power

B02H PNX Power

B02H



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2S23 B6	2S5M G11
2S26 A6	2S5P F5
2S27 B3	2S60 A6
2S28 B3	2S61 A6
2S29 C6	2S62 A7
2S43 B2	2S63 A7
2S45 F11	2S64 A7
2S46 F11	2S65 A7
2S4M B12	2S66 A7
2S4N C11	2S67 A8
2S4P C11	2S68 A8
2S4Q B3	2S6A A11
2S4R B4	2S6B A11
2S4S F5	2S6C C11
2S4T H11	2S6D B11
2S4U D11	2S6E B11
2S4V D11	2S6F C11
2S4W D11	2S6G C11
2S4Y D11	2S6H H11
2S4Z E11	2S6K H11
2S50 E11	2S6L I11
2S51 E9	2S6M I11
2S52 E9	2S6N C11
2S53 H11	2S6P C12
2S55 G11	2SHW I11
2S56 G11	5S80 A12
2S57 G11	5S81 A12
2S58 H11	5S82 A12
2S59 I11	5S83 D12
2S5A A11	5S84 E12
2S5B A11	5S85 C12
2S5C B11	5S87 F12
2S5D B11	5S88 G12
2S5G-1 B4	5S89 H12
2S5G-2 B4	5S90 H12
2S5G-3 B4	5S92 I12
2S5G-4 B5	5S93 B12
2S5H-1 B5	5S94 F5
2S5H-2 B5	5S95 E10
2S5H-3 B5	7S00-10 B6
2S5H-4 B5	7S00-12 C1
2S5J-1 C5	IS3K D10
2S5J-2 C5	IS3L D10
2S5J-3 C5	IS3Q A10
2S5J-4 C5	IS3S A10
2S5K-1 C4	IS58 I10
2S5K-2 C4	c000 E13
2S5K-3 C4	c001 B5

B02H

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PNX Analog Video

B02I PNX Analog Video

B02I

Connectivity

EU: SCART1
AP: -

EU: YPBPR1
AP: YPBPR1

EU: SCART2
AP: YPBPR2
+CVBS

EU: VGA
AP: VGA

AV1-CVBS
AV1-R
AV1-B
AV1-G
YPBPR1-SYNCIN1
AV3-Y
AV3-PR
AV3-PB
AV2-CVBS
YPBPR2-SYNCIN2
AV4-Y
AV4-PR
AV4-PB
R-VGA
G-VGA
B-VGA
H-SYNC-VGA
V-SYNC-VGA
VGA-SCL-EDID
VGA-SDA-EDID
VGA-SCL-EDID-TCON
VGA-SDA-EDID-TCON

2S87 22n 3S59 47R
2S7J 22n 3S4J 82R
2S7K 22n 3S4L 82R
2S7H 22n 3S4K 82R
2S7M 10n
2S7L 22n 3S4P 82R
2S7N 22n 3S4R 82R
2S7P 22n 3S4T 82R
2S8G 22n 3S5A 47R
2S7Q 10n
2S7R 22n 3S4U 82R
2S7U 22n 3S4W 82R
2S7E 22n 3S4G 82R
2S84 22n 3S50 82R
2S85 22n 3S52 82R
2S86 22n 3S54 82R
3S5T-1 100R
3S5T-3 100R
3S5V-3 100R
3S5V-1 100R
9S14 *
9S15 *
* = TCON ONLY

7S00-1 PNX85500 ANALOG_VIDEO
AB15 CVBS_Y1
AC13 R
AD13 B
AE13 G
AV1
AF15 SYNCIN1
AE15 Y_G1
AC15 PR_R_C1
AD15 PB_B1
AB14 CVBS_Y2
AF14 SYNCIN2
AE14 Y_G2
AC14 PR_R_C2
AD14 PB_B2
AF16 R
AD16 G
AE16 B
VGA
AB18 HSYNC_IN
AC18 VSYNC_IN
AF4 VSYNC_OUT
AD24 SCL
AD25 SDA
VGA_EDID
ATV_CVBS_Y3 C3 AC12 AF13 IS5C
CVBS_Y7 C7 AD11 AC11
CVBS1_OUT AF11
CVBS2_OUT AE11 BS13
RESREF AB10
CURREF AA11 IS5E 3S5S 10K
REF AC16 IS5D
AB16 IS5F
AB13 IS5G
AB12 IS5H
AA12 IS5J
AA10
IF_AGC AD12 BS15
RF_AGC AB11 BS17
AE12 P
AF12 N BS09 BS10
TUNER
AGND
AA14

2S8A 22n 3S06 47R 9S17 Y-SVHS
2S22 22n 3S05 47R C-SVHS
3S5E 560R CVBS-MON-OUT1
IS4V
47P 2S40
3S08 560R
IS4W
3S09 0R2
2S19 22n
2S18 22n
2S16 22n
2S15 22n
2S14 22n
3S75 47K 2S75 10n PNX-IF-AGC
3S76 47K 2S76 10n IS11 PNX-RF-AGC
2S77 10n PNX-IF-P
2S78 10n PNX-IF-N
3S5T-4 100R
3S5T-2 100R
3S5V-4 100R
3S5V-2 100R

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2S14 D12
2S15 D12
2S16 D12
2S18 D12
2S19 D12
2S22 A11
2S40 B11
2S75 F11
2S76 F11
2S77 F12
2S78 G12
2S7E G6
2S7H B6
2S7J A6
2S7K B6
2S7L C6
2S7M C6
2S7N D6
2S7P D6
2S7Q E6
2S7R F6
2S7U F6
2S84 G6
2S85 H6
2S86 H6
2S87 A6
2S8A A11
2S8G E6
3S05 A11
3S08 B11
3S09 C11
3S4G G6
3S4J A6
3S4K C6
3S4L B6
3S4P D6
3S4R D6
3S4T D6
3S4U F6
3S4W F6
3S50 H6
3S52 H6
3S54 I6
3S59 A6
3S5B A11
3S5E B11
3S5L E6
3S5S E9
3S5T-1 I5
3S5T-2 I11
3S5T-3 I5
3S5T-4 I11
3S5V-1 I5
3S5V-2 I12
3S5V-3 I5
3S5V-4 I12
3S75 E12
3S76 F12
7S00-1 D8
9S14 I3
9S15 I3
9S17 A13
BS09 F9
BS10 F10
BS13 E9
BS15 F9
BS17 F10
IS11 F13
IS4V B10
IS4W C10
IS5C D9
IS5D E9
IS5E E9
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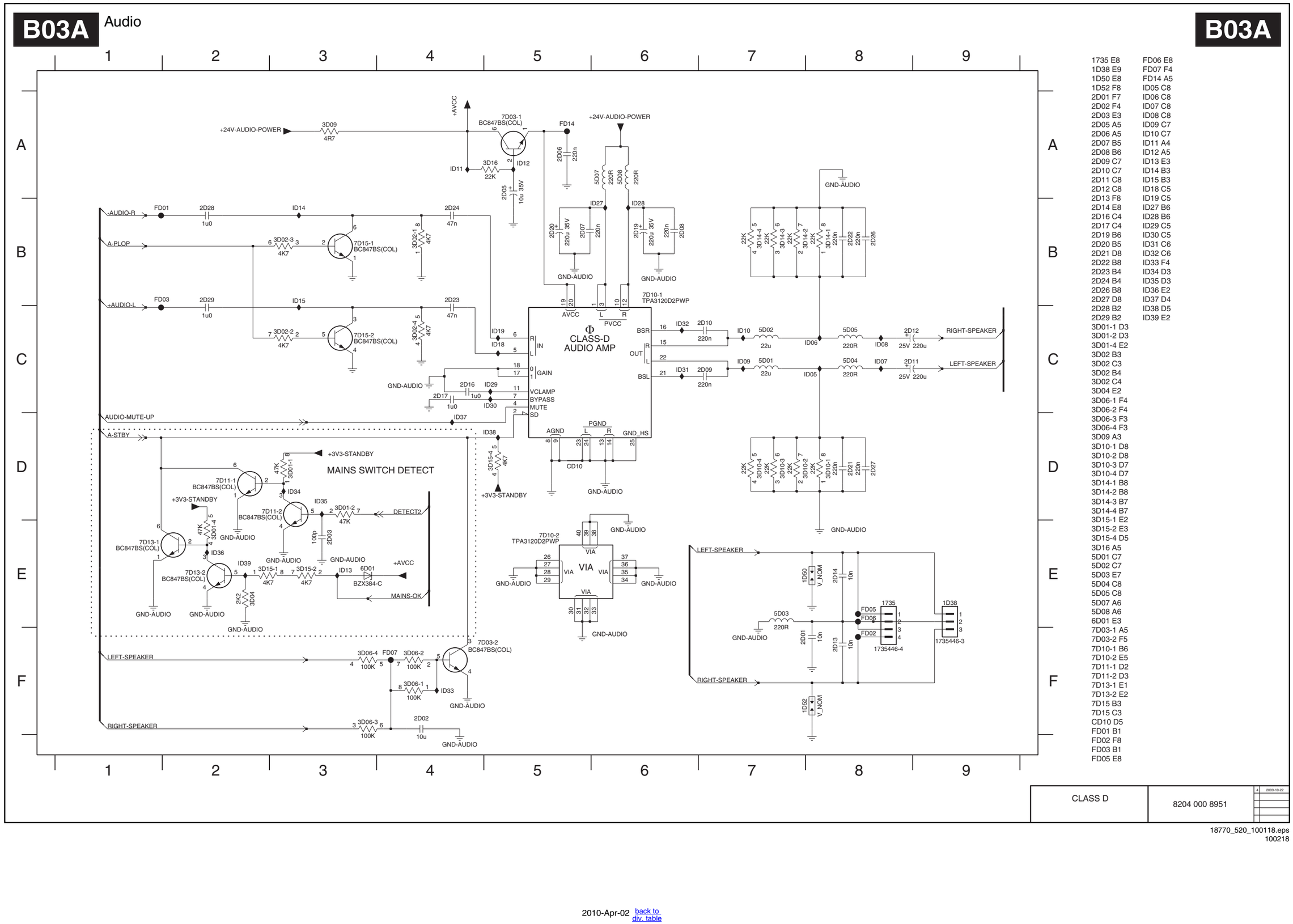
IS5G E9
IS5H E9
IS5J E9

10-11 B03 820400089514 CLASS D

Audio

B03A Audio



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1D38 E9
1D50 E8
1D52 F8
2D01 F7
2D02 F4
2D03 E3
2D05 A5
2D06 A5
2D07 B5
2D08 B6
2D09 C7
2D10 C7
2D11 C8
2D12 C8
2D13 F8
2D14 E8
2D16 C4
2D17 C4
2D19 B6
2D20 B5
2D21 D8
2D22 B8
2D23 B4
2D24 B4
2D26 B8
2D27 D8
2D28 B2
2D29 B2
3D01-1 D3
3D01-2 D3
3D01-4 E2
3D02 B3
3D02 C3
3D02 B4
3D02 C4
3D04 E2
3D06-1 F4
3D06-2 F4
3D06-3 F3
3D06-4 F3
3D09 A3
3D10-1 D8
3D10-2 D8
3D10-3 D7
3D10-4 D7
3D14-1 B8
3D14-2 B8
3D14-3 B7
3D14-4 B7
3D15-1 E2
3D15-2 E3
3D15-4 D5
3D16 A5
5D01 C7
5D02 C7
5D03 E7
5D04 C8
5D05 C8
5D07 A6
5D08 A6
6D01 E3
7D03-1 A5
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7D11-1 D2
7D11-2 D3
7D13-1 E1
7D13-2 E2
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7D15 C3
CD10 D5
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FD02 F8
FD03 B1
FD05 E8
FD06 E8
FD07 F4
FD14 A5
ID05 C8
ID06 C8
ID07 C8
ID08 C8
ID09 C7
ID10 C7
ID11 A4
ID12 A5
ID13 E3
ID14 B3
ID15 B3
ID18 C5
ID19 C5
ID27 B6
ID28 B6
ID29 C5
ID30 C5
ID31 C6
ID32 C6
ID33 F4
ID34 D3
ID35 D3
ID36 E2
ID37 D4
ID38 D5
ID39 E2

CLASS D	8204 000 8951	4 2009-10-22

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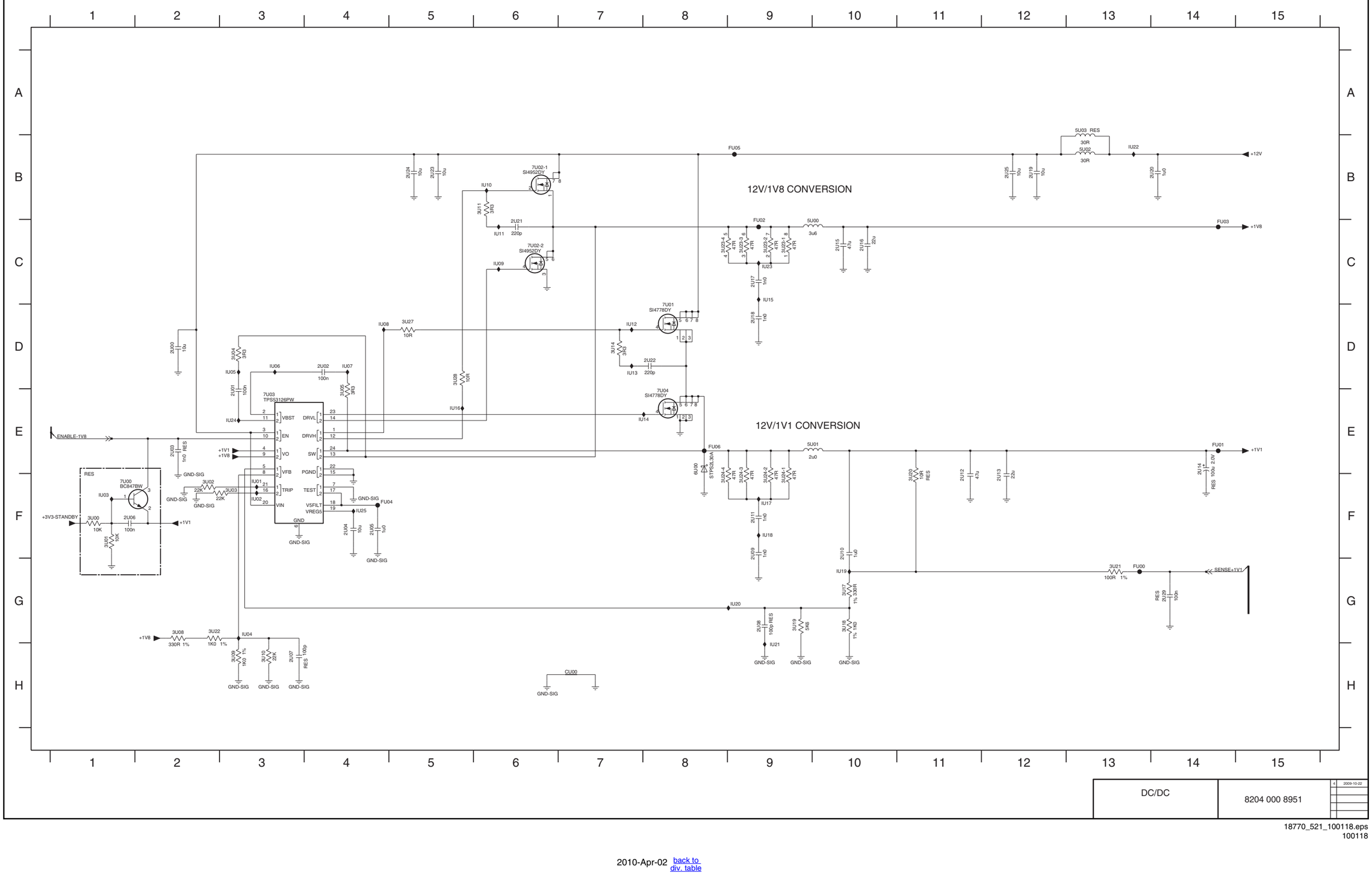
DC/DC

B03B DC/DC

B03B

2U00 D2 2U01 E3 2U02 D4 2U03 E2 2U04 F4 2U05 F4 2U06 F1 2U07 H3 2U08 G9 2U09 F9 2U10 F10 2U11 F9 2U12 F11 2U13 F12 2U14 E14 2U15 C10 2U16 C10 2U17 C9 2U18 D9 2U19 B12 2U20 B14 2U21 C6 2U22 D8 2U23 B5 2U24 B5 2U25 B12 2U29 G14 3U00 F1 3U01 F1 3U02 F2 3U03 F3 3U04 D3 3U05 E4 3U08 G2 3U09 H3 3U10 H3 3U11 B6 3U14 D7 3U17 G10 3U18 G10 3U19 G9 3U20 F11 3U21 G13 3U22 G2 3U23-1 C9 3U23-2 C9 3U23-3 C9 3U23-4 C8 3U24-1 F9 3U24-2 F9 3U24-3 F9 3U24-4 F8 3U27 D5 3U28 D5 5U00 C10 5U01 E10 5U02 B13 5U03 A13 6U00 E8 7U00 F1 7U01 D8 7U02-1 E3 7U02-2 C6 7U03 E3 7U04 E8 CU00 H7 FU00 G13 FU01 E14 FU02 B9 FU03 C14 FU04 F4 FU05 B9 FU06 E8 IU01 F3 IU02 F3 IU03 F1 IU04 G3 IU05 D3 IU06 D3 IU07 D4 IU08 D4 IU09 C6 IU10 B6 IU11 C6 IU12 D7 IU13 C9 IU14 E8 IU15 F9 IU16 F9 IU17 F9 IU18 F9 IU19 G10 IU20 G9 IU21 H9 IU22 B13 IU23 C9 IU24 E3 IU25 F4



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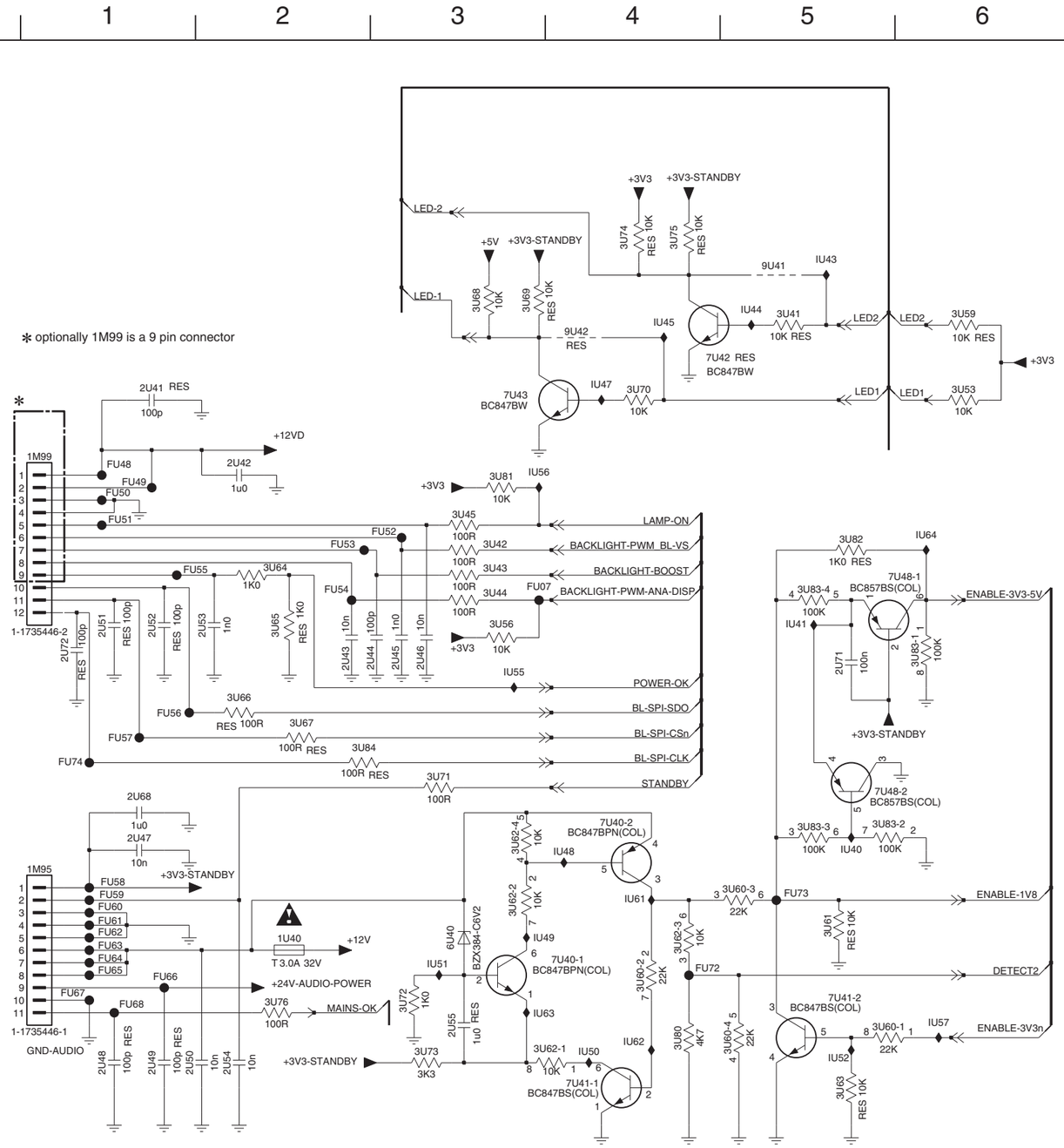
DC/DC

B03C DC/DC



B03C

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1M99 C1	6U40 E3
1U40 E2	7U40-1 F4
2U41 B1	7U40-2 E4
2U42 C2	7U41-1 F4
2U43 D2	7U41-2 F5
2U44 D3	7U42 B5
2U45 D3	7U43 B3
2U46 D3	7U48-1 C6
2U47 E1	7U48-2 E6
2U48 F1	9U41 B5
2U49 F1	9U42 B4
2U50 F1	FU07 C3
2U51 D1	FU48 C1
2U52 D1	FU49 C1
2U53 D2	FU50 C1
2U54 F2	FU51 C1
2U55 F3	FU52 C3
2U68 E1	FU53 C2
2U71 D5	FU54 C2
2U72 D1	FU55 C1
3U41 B5	FU56 D1
3U42 C3	FU57 D1
3U43 C3	FU58 E1
3U44 C3	FU59 E1
3U45 C3	FU60 E1
3U53 B6	FU61 E1
3U56 D3	FU62 E1
3U59 B6	FU63 E1
3U60-1 F5	FU64 F1
3U60-2 F4	FU65 F1
3U60-3 E5	FU66 F1
3U60-4 F5	FU67 F1
3U61 E5	FU68 F1
3U62-1 F4	FU72 F4
3U62-2 E3	FU73 E5
3U62-3 E4	FU74 D1
3U62-4 E3	IU40 E5
3U63 F5	IU41 D5
3U64 C2	IU43 B5
3U65 D2	IU44 B5
3U66 D2	IU45 B4
3U67 D2	IU47 B4
3U68 B3	IU48 E4
3U69 B3	IU49 E3
3U70 B4	IU50 F4
3U71 D3	IU51 F3
3U72 F3	IU52 F5
3U73 F3	IU55 D3
3U74 A4	IU56 C3
3U75 A4	IU57 F6
3U76 F2	IU61 E4
3U80 F4	IU62 F4
3U81 C3	IU63 F3
3U82 C5	IU64 C6
3U83-1 D6	
3U83-2 E5	
3U83-3 E5	
3U83-4 C5	

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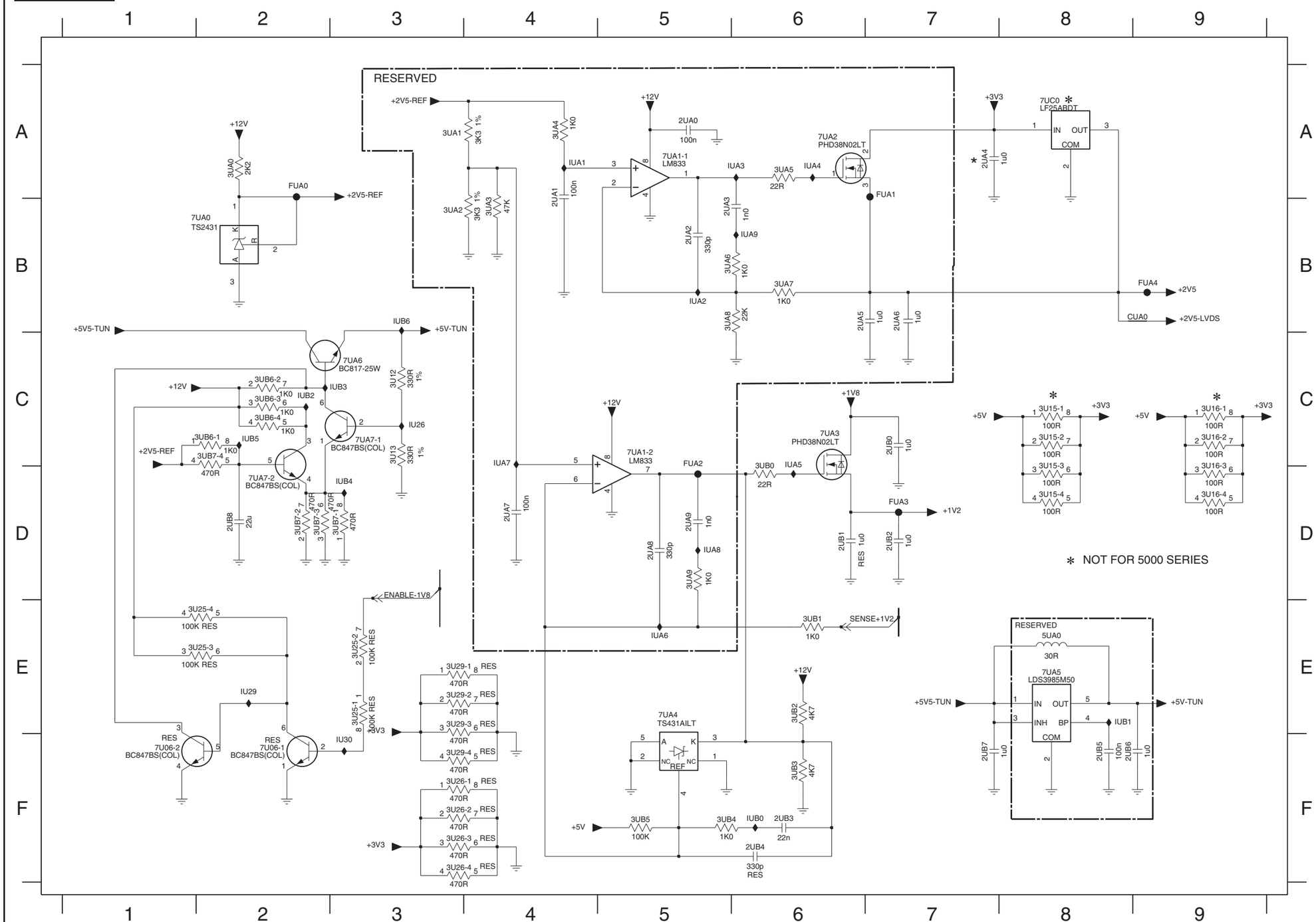
DC/DC

B03D DC/DC

B03D



2UA0 A5	3UB3 F6
2UA1 A4	3UB4 F5
2UA2 B5	3UB5 F5
2UA3 B5	3UB6-1 C2
2UA4 A7	3UB6-2 C2
2UA5 B6	3UB6-3 C2
2UA6 B7	3UB6-4 C2
2UA7 D4	3UB7-1 D3
2UA8 D5	3UB7-2 D2
2UA9 D5	3UB7-3 D2
2UB0 C7	3UB7-4 C2
2UB1 D6	5UA0 E8
2UB2 D7	7U06-1 F2
2UB3 F6	7U06-2 F1
2UB4 F6	7UA0 B2
2UB5 F8	7UA1-1 A5
2UB6 F8	7UA1-2 C5
2UB7 F7	7UA2 A6
2UB8 D2	7UA3 C6
3U12 C3	7UA4 E5
3U13 C3	7UA5 E8
3U15-1 C8	7UA6 C3
3U15-2 C8	7UA7-1 C3
3U15-3 D8	7UA7-2 D2
3U15-4 D8	7UC0 A8
3U16-1 C9	CUA0 B9
3U16-2 C9	FUA0 A2
3U16-3 D9	FUA1 A7
3U16-4 D9	FUA2 D5
3U25-1 E3	FUA3 D7
3U25-2 E3	FUA4 B9
3U25-3 E2	IU26 C3
3U25-4 E2	IU29 E2
3U26-1 F3	IU30 F3
3U26-2 F3	IUA1 A4
3U26-3 F3	IUA2 B5
3U26-4 F3	IUA3 A6
3U29-1 E3	IUA4 A6
3U29-2 E3	IUA5 C6
3U29-3 E3	IUA6 E5
3U29-4 F3	IUA7 C4
3UA0 A2	IUA8 D5
3UA1 A3	IUA9 B6
3UA2 B3	IUB0 F6
3UA3 B4	IUB1 E8
3UA4 A4	IUB2 C2
3UA5 A6	IUB3 C3
3UA6 B5	IUB4 D3
3UA7 B6	IUB5 C2
3UA8 B5	IUB6 B3
3UA9 D5	
3UB0 D6	
3UB1 E6	
3UB2 E6	

B03D

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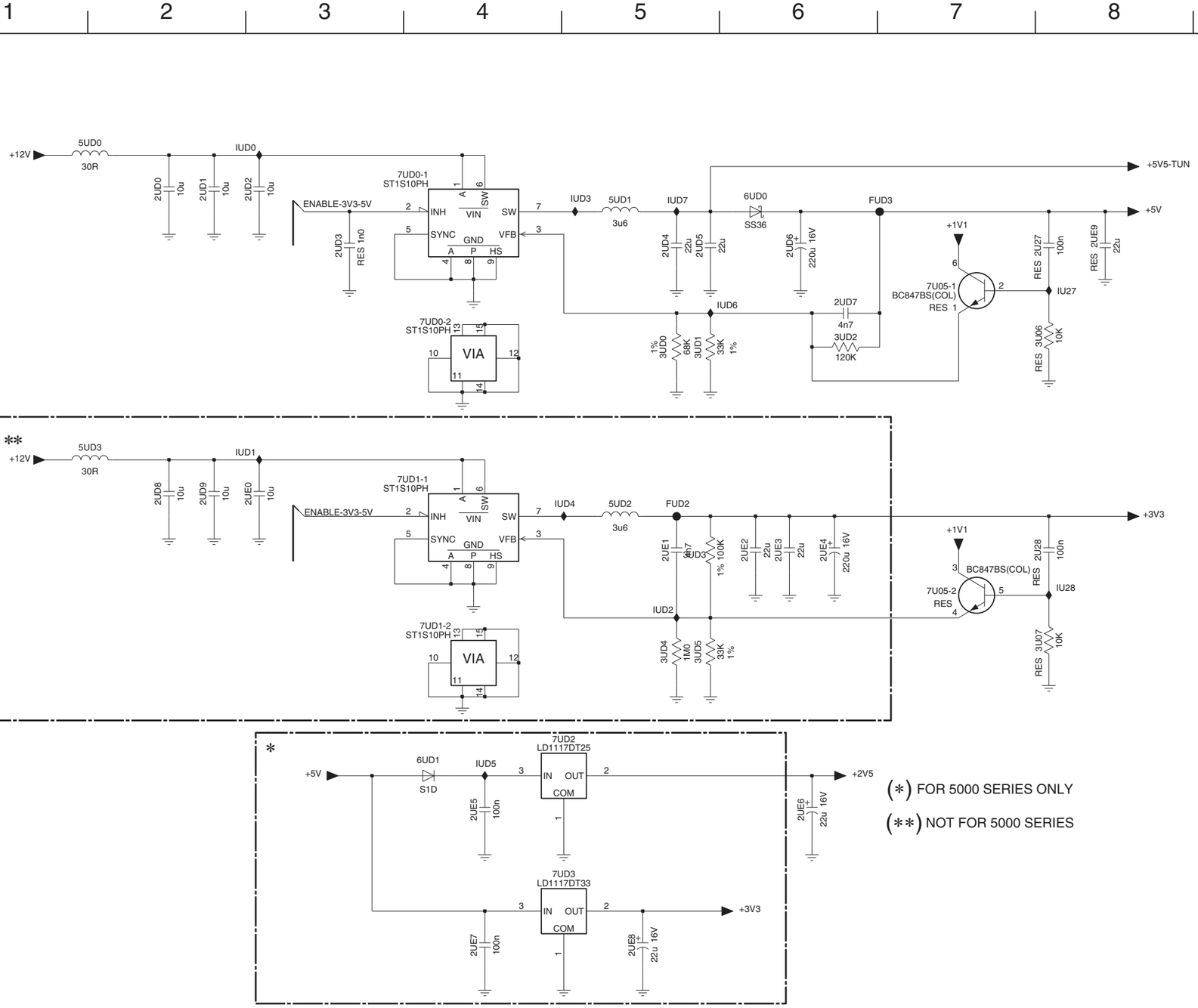
DC/DC

B03E DC/DC

B03E



(*) FOR 5000 SERIES ONLY

(**) NOT FOR 5000 SERIES

2U27 B8
2U28 D8
2UD0 A2
2UD1 A2
2UD2 A3
2UD3 B3
2UD4 B5
2UD5 B5
2UD6 B6
2UD7 B6
2UD8 C2
2UD9 C2
2UE0 C3
2UE1 D5
2UE2 D6
2UE3 D6
2UE4 D6
2UE5 E4
2UE6 E6
2UE7 F4
2UE8 F5
2UE9 B8
3U06 B8
3U07 D8
3UD0 B5
3UD1 B5
3UD2 B6
3UD3 D5
3UD4 D5
3UD5 D5
5UD0 A2
5UD1 A5
5UD2 C5
5UD3 C2
6UD0 A6
6UD1 E4
7U05-1 B7
7U05-2 D7
7UD0-1 A4
7UD0-2 B4
7UD1-1 C4
7UD1-2 D4
7UD2 E5
7UD3 F5
FUD2 C5
FUD3 A7
IU27 B8
IU28 D8
IUD0 A2
IUD1 C2
IUD2 D5
IUD3 A5
IUD4 C5
IUD5 E4
IUD6 B6
IUD7 A5

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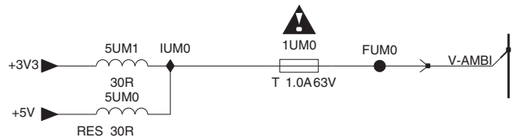
Temp Sensor + AmbiLight

B03F Temp Sensor + AmbiLight

B03F

1UM0 A4
5UM0 A3
5UM1 A3
FUM0 A5
IUM0 A4



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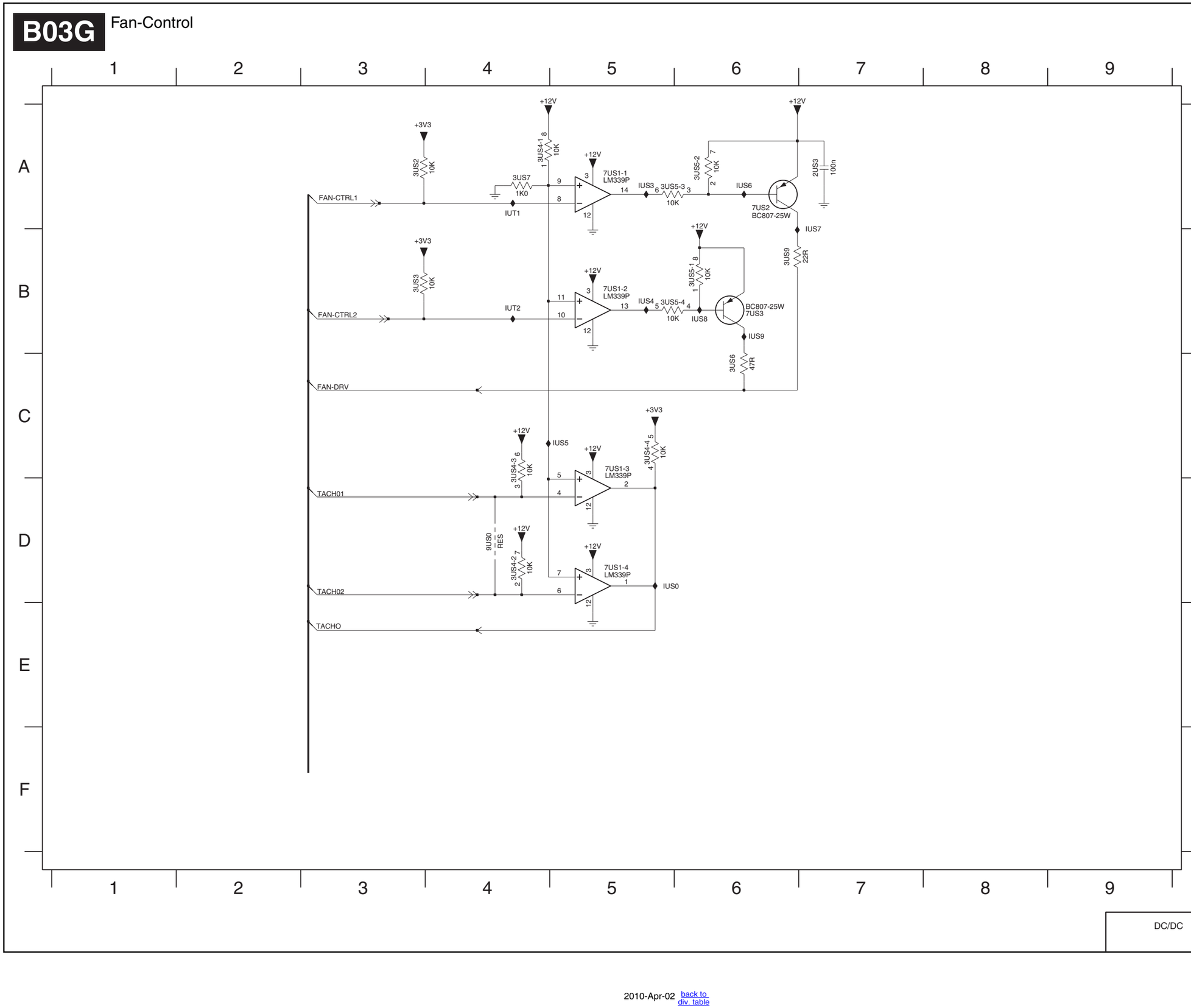
Fan Control

B03G Fan-Control



2US3 A7
3US2 A3
3US3 B3
3US4-1 A4
3US4-2 D4
3US4-3 C4
3US4-4 C5
3US5-1 B6
3US5-2 A6
3US5-3 A5
3US5-4 B5
3US6 C6
3US7 A4
3US9 B6
7US1-1 A5
7US1-2 B5
7US1-3 C5
7US1-4 D5
7US2 A6
7US3 B6
9US0 D4
IUS0 D5
IUS3 A5
IUS4 B5
IUS5 C5
IUS6 A6
IUS7 B7
IUS8 B6
IUS9 B6
IUT1 A4
IUT2 B4

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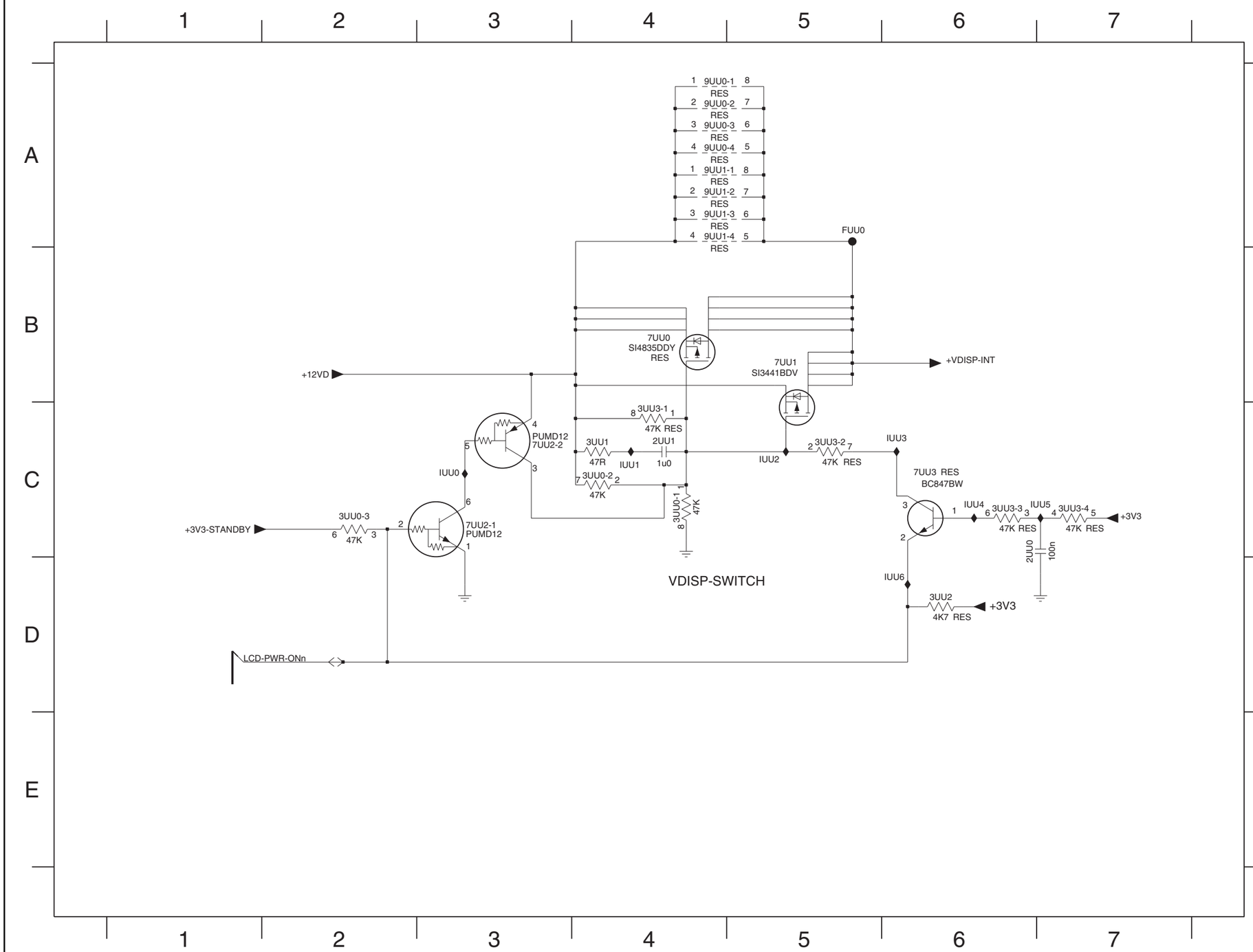
Vdisp Switch

B03H VDisp-Switch

B03H



2UU0 C6
2UU1 C4
3UU0-1 C4
3UU0-2 C4
3UU0-3 C2
3UU1 C4
3UU2 D6
3UU3-1 C4
3UU3-2 C5
3UU3-3 C6
3UU3-4 C7
7UU0 B4
7UU1 B5
7UU2-1 C3
7UU2-2 C3
7UU3 C6
9UU0-1 A4
9UU0-2 A4
9UU0-3 A4
9UU0-4 A4
9UU1-1 A4
9UU1-2 A4
9UU1-3 A4
9UU1-4 A4
FUU0 A5
IUU0 C3
IUU1 C4
IUU2 C5
IUU3 C6
IUU4 C6
IUU5 C7
IUU6 D6

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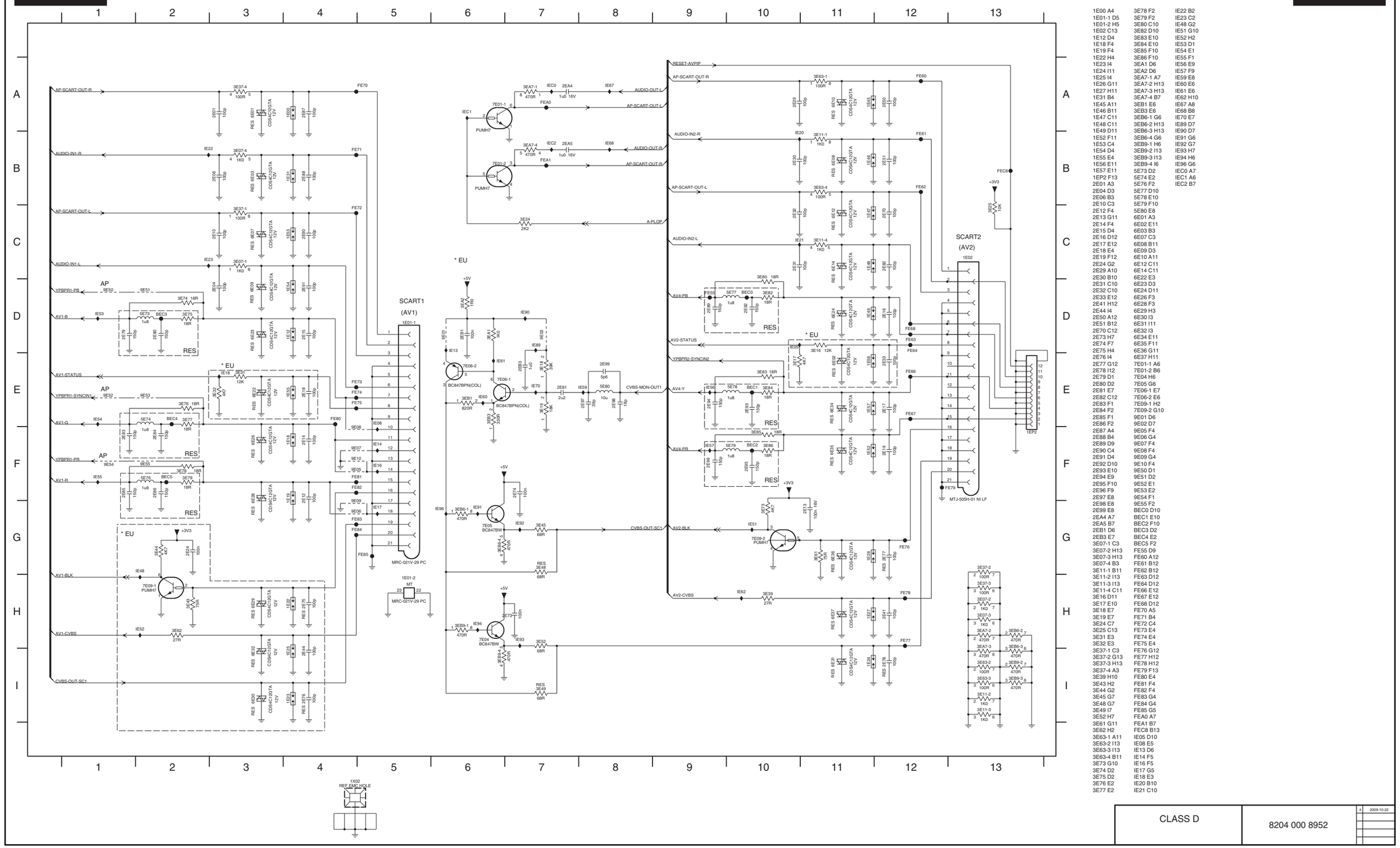
10-12 B04 820400089524 Analog I/O

Analogue Externals A

B04A Analogue Externals A



1E00 A4
1E01-1 D5
1E01-2 H5
1E02 C13
1E12 D4
1E18 F4
1E19 F4
1E22 H4
1E23 I4
1E24 I11
1E25 I4
1E26 G11
1E27 H11
1E31 B4
1E45 A11
1E46 B11
1E47 C11
1E48 C11
1E49 D11
1E52 F11
1E53 C4
1E54 D4
1E55 E4
1E56 E11
1E57 E11
1EP2 F13
2E01 A3
2E04 D3
2E06 B3
2E10 C3
2E12 F4
2E13 G11
2E14 F4
2E15 D4
2E16 D12
2E17 E12
2E18 E4
2E19 F12
2E24 G2
2E29 A10
2E30 B10
2E31 C10
2E32 C10
2E33 E12
2E41 H12
2E44 I4
2E50 A12
2E51 B12
2E70 C12
2E73 H7
2E74 F7
2E75 H4
2E76 I4
2E77 G12
2E78 I12
2E79 D1
2E80 D2
2E81 E7
2E82 C12
2E83 F1
2E84 F2
2E85 F1
2E86 F2
2E87 A4
2E88 B4
2E89 D9
2E90 C4
2E91 D4
2E92 D10
2E93 E10
2E94 E9
2E95 F10
2E96 F9
2E97 E8
2E98 E8
2E99 E8
2EA4 A7
2EA5 B7
2EB1 D6
2EB3 E7
3E07-1 C3
3E07-2 H13
3E07-3 H13
3E07-4 B3
3E11-1 B11
3E11-2 I13
3E11-3 I13
3E11-4 C11
3E16 D11
3E17 E10
3E18 E7
3E19 E7
3E24 C7
3E25 C13
3E31 E3
3E32 E3
3E37-1 C3
3E37-2 G13
3E37-3 H13
3E37-4 A3
3E39 H10
3E43 H2
3E44 G2
3E45 G7
3E48 G7
3E49 I7
3E52 H7
3E61 G11
3E62 H2
3E63-1 A11
3E63-2 I13
3E63-3 I13
3E63-4 B11
3E73 G10
3E74 D2
3E75 D2
3E76 E2
3E77 E2
3E78 F2
3E79 F2
3E80 C10
3E82 D10
3E83 E10
3E84 E10
3E85 F10
3E86 F10
3EA1 D6
3EA2 D6
3EA7-1 A7
3EA7-2 H13
3EA7-3 H13
3EA7-4 B7
3EB1 E6
3EB3 E6
3EB6-1 G6
3EB6-2 H13
3EB6-3 H13
3EB6-4 G6
3EB9-1 H6
3EB9-2 I13
3EB9-3 I13
3EB9-4 I6
5E73 D2
5E74 E2
5E76 F2
5E77 D10
5E78 E10
5E79 F10
5E80 E8
6E01 A3
6E02 E11
6E03 B3
6E07 C3
6E08 B11
6E09 D3
6E10 A11
6E12 C11
6E14 C11
6E22 E3
6E23 D3
6E24 D11
6E26 F3
6E28 F3
6E29 H3
6E30 I3
6E31 I11
6E32 I3
6E34 E11
6E35 F11
6E36 G11
6E37 H11
7E01-1 A6
7E01-2 B6
7E04 H6
7E05 G6
7E06-1 E7
7E06-2 E6
7E09-1 H2
7E09-2 G10
9E01 D6
9E02 D7
9E05 F4
9E06 G4
9E07 F4
9E08 F4
9E09 G4
9E10 F4
9E50 D1
9E51 D2
9E52 E1
9E53 E2
9E54 F1
9E55 F2
BEC0 D10
BEC1 E10
BEC2 F10
BEC3 D2
BEC4 E2
BEC5 F2
FE55 D9
FE60 A12
FE61 B12
FE62 B12
FE63 D12
FE64 D12
FE66 E12
FE67 E12
FE68 D12
FE70 A5
FE71 B4
FE72 C4
FE73 E4
FE74 E4
FE75 E4
FE76 G12
FE77 H12
FE78 H12
FE79 F13
FE80 E4
FE81 F4
FE82 F4
FE83 G4
FE84 G4
FE85 G5
FEA0 A7
FEA1 B7
FEC8 B13
IE05 D10
IE08 E5
IE13 D6
IE14 F5
IE16 F5
IE17 G5
IE18 E3
IE20 B10
IE21 C10
IE22 B2
IE23 C2
IE48 G2
IE51 G10
IE52 H2
IE53 D1
IE54 E1
IE55 F1
IE56 E9
IE57 D1
IE59 E8
IE60 E8
IE61 E8
IE62 E8
IE67 A7
IE68 B7
IE90 D6
IE91 E6
IE92 E6
IE93 H7
IE94 H6
IE96 G6
IEC0 A7
IEC1 A6
IEC2 B7

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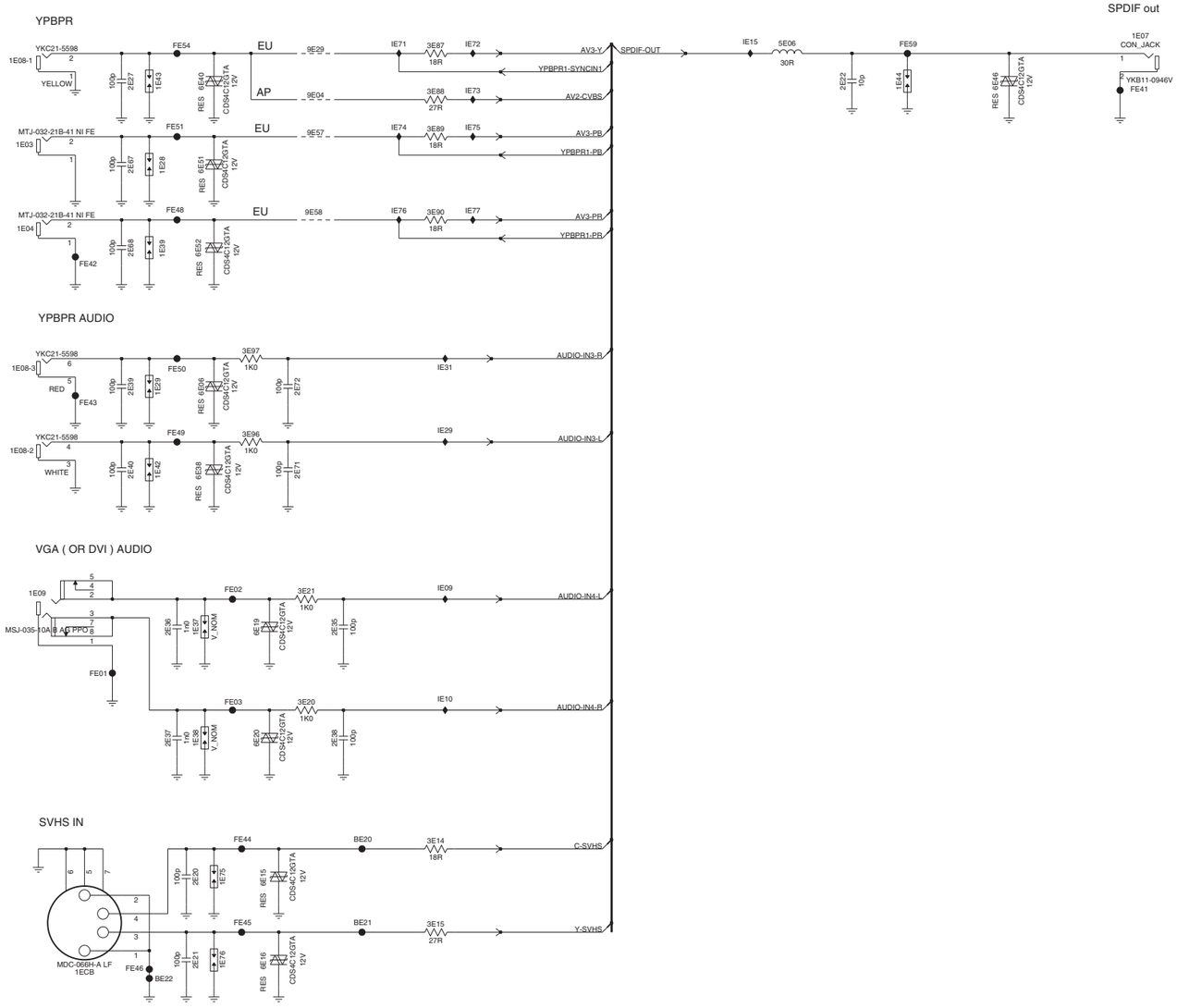
Analogue Externals B

B04B Analogue Externals B

B04B



1E03 B3
1E04 C3
1E07 A12
1E08-1 B3
1E08-2 E3
1E08-3 D3
1E09 F3
1E28 B4
1E29 D4
1E37 F4
1E38 G4
1E39 C4
1E42 E4
1E43 B4
1E44 B10
1E75 H5
1E76 I5
1ECB I4
2E20 H4
2E21 I4
2E22 B9
2E27 B4
2E35 F6
2E36 F4
2E37 G4
2E38 G6
2E39 D4
2E40 E4
2E67 B4
2E68 C4
2E71 E5
2E72 D5
3E14 H6
3E15 H6
3E20 G5
3E21 F5
3E87 B6
3E88 B6
3E89 B6
3E90 C6
3E96 E5
3E97 D5
5E06 B9
6E06 D5
6E15 H5
6E16 I5
6E19 F5
6E20 G5
6E38 E5
6E40 B5
6E46 B11
6E51 B4
6E52 C4
9E04 B5
9E29 B5
9E57 B5
9E58 C5
BE20 H6
BE21 H6
BE22 I4
FE01 F4
FE02 F5
FE03 G5
FE41 B12
FE42 C4
FE43 D4
FE44 H5
FE45 H5
FE46 I4
FE48 C4
FE49 E4
FE50 D4
FE51 B4
FE54 B4
FE59 B10
IE09 F6
IE10 G6
IE15 B9
IE29 E6
IE31 D6
IE71 B6
IE72 B7
IE73 B7
IE74 B6
IE75 B7
IE76 C6
IE77 C7

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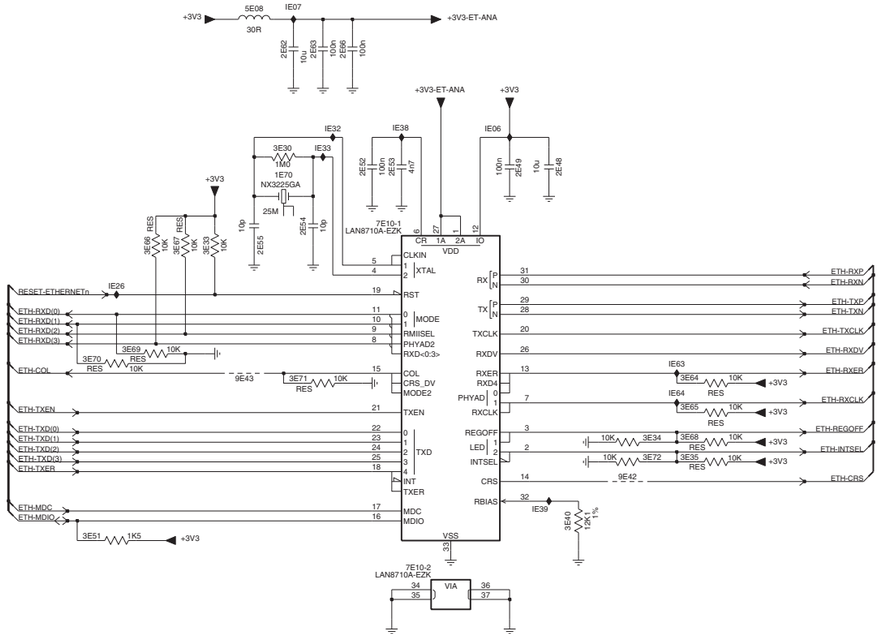
Ethernet + Service

B04C Ethernet + Service



CONFIGURATION RESISTOR SETTINGS

Resistor	POP	EMPTY
3E64 (RES)	PHYADD(0) = 1	PHYADD(0) = 0
3E65 (RES)	PHYADD(1) = 1	PHYADD(1) = 0
3E66 (RES)	PHYADD(2) = 1	PHYADD(2) = 0
3E67 (RES)	RMII mode selected	MII mode selected
3E68 (RES)	Internal 1.2V reg. disabled	Internal 1.2V reg. enabled
3E69 (RES)	MODE(0) = 0	MODE(0) = 1
3E70 (RES)	MODE(1) = 0	MODE(1) = 1
3E71 (RES)	MODE(2) = 0	MODE(2) = 1
3E72	INTERRUPT FUNCTION DISABLED ON nINT/TXER/TXD4 SIGNAL	INTERRUPT FUNCTION ENABLED ON nINT/TXER/TXD4 SIGNAL

1E06 A13
1E70 B3
1E85 A11
1E86 A11
1N00 G7
2E48 B5
2E49 B5
2E52 B3
2E53 B4
2E54 B3
2E55 B3
2E56 H2
2E57 H2
2E58 H3
2E59 H4
2E60 H5
2E62 A3
2E63 A3
2E66 A3
3E22-1 F2
3E22-2 F3
3E22-3 F2
3E22-4 F2
3E26 F5
3E30 B3
3E33 B2
3E34 D6
3E35 D6
3E40 D5
3E51 E1
3E53-1 A10
3E53-2 A9
3E53-3 A10
3E53-4 A9
3E64 C6
3E65 D6
3E66 B2
3E67 B2
3E68 D6
3E69 C2
3E70 C1
3E71 C3
3E72 D6
3E95-1 F3
3E95-2 F3
3E95-3 F4
3E95-4 F4
3E98 F5
5E08 A3
6E43 A9
6E44 A10
6E47 G2
6E48 G3
6E49 G4
6E50 G5
7E10-1 B4
7E10-2 E4
9E42 D5
9E43 C3
BE00 G6
BE01 G6
BE02 G6
BE03 H6
FE27 G6
FE28 G6
FE29 G6
FE30 G6
FE31 H6
FE32 I5
FE33 I5
FE34 H6
FE56 A11
FE57 A11
FE58 A11
IE06 B4
IE07 A3
IE26 C2
IE32 B3
IE33 B3
IE38 B4
IE39 D5
IE49 A10
IE50 A9
IE63 C6
IE64 C6

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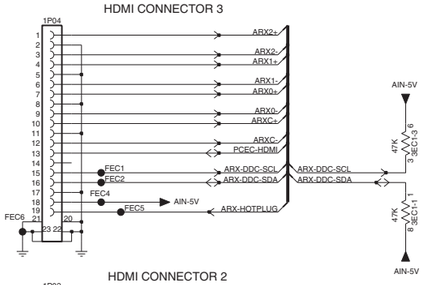
HDMI

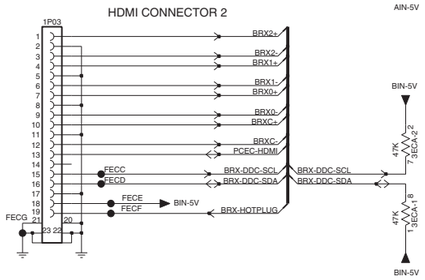
B04D HDMI

B04D

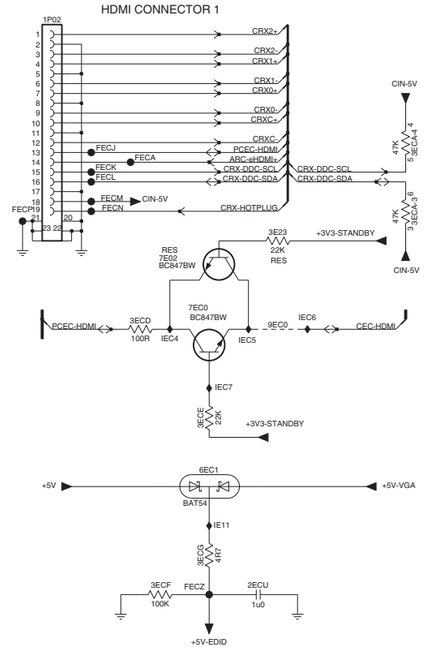
HDMI CONNECTOR 3



HDMI CONNECTOR 2

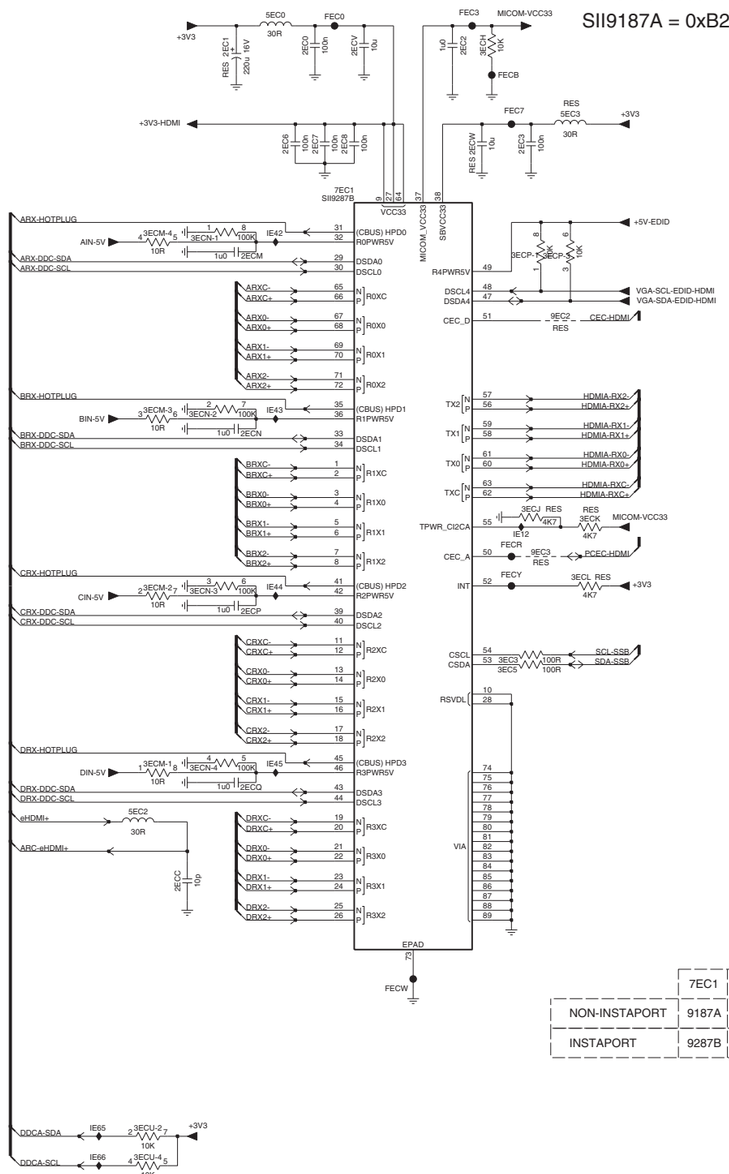


HDMI CONNECTOR 1



I2C Address

SII9187A = 0xB2



	7EC1	3ECN	3ECF
NON-INSTAPORT	9187A	4X 3K3	3K3
INSTAPORT	9287B	4X 100K	100K

1P02	E2
1P03	C2
1P04	A2
2EC0	A9
2EC1	A8
2EC2	A10
2EC3	B10
2EC6	B9
2EC7	B9
2EC8	B9
2ECC	G8
2ECM	B8
2ECN	D8
2ECP	E8
2ECQ	F8
2ECU	I3
2ECV	A9
2ECW	B10
3E23	F4
3EC1-1	B4
3EC1-3	B4
3EC3	E10
3EC5	E10
3ECA-1	D4
3ECA-2	D4
3ECA-3	F4
3ECA-4	F4
3ECD	G3
3ECE	H3
3ECF	I3
3ECG	I3
3ECH	A10
3ECJ	D10
3ECK	D11
3ECL	E11
3ECM-1	F8
3ECM-2	E8
3ECM-3	D8
3ECM-4	B8
3ECN-1	B8
3ECN-2	D8
3ECN-3	E8
3ECN-4	F8
3ECP-1	B10
3ECP-3	B10
3ECU-2	I8
3ECU-4	I8

5EC0	A8
5EC2	F7
5EC3	A11
6EC1	H3
7E02	G3
7EC0	G3
7EC1	B9
9EC0	G4
9EC2	C11
9EC3	E11
FEC0	A9
FEC1	B2
FEC2	B2
FEC3	A10
FEC4	B2
FEC5	B2
FEC6	B2
FEC7	A10
FECA	F3
FECB	A10
FECC	D2
FECD	D2
FECE	D2
FECF	D2
FECG	D2
FECJ	F2
FECK	F2
FECL	F2
FECM	F2
FECN	F2
FECP	F2
FECR	E10
FECW	H9
FECY	E10
FECZ	I3
IE11	I3
IE12	D10
IE42	B8
IE43	D8
IE44	E8
IE45	F8
IE65	I7
IE66	I7
IEC4	G3
IEC5	G3
IEC6	G4
IEC7	H3

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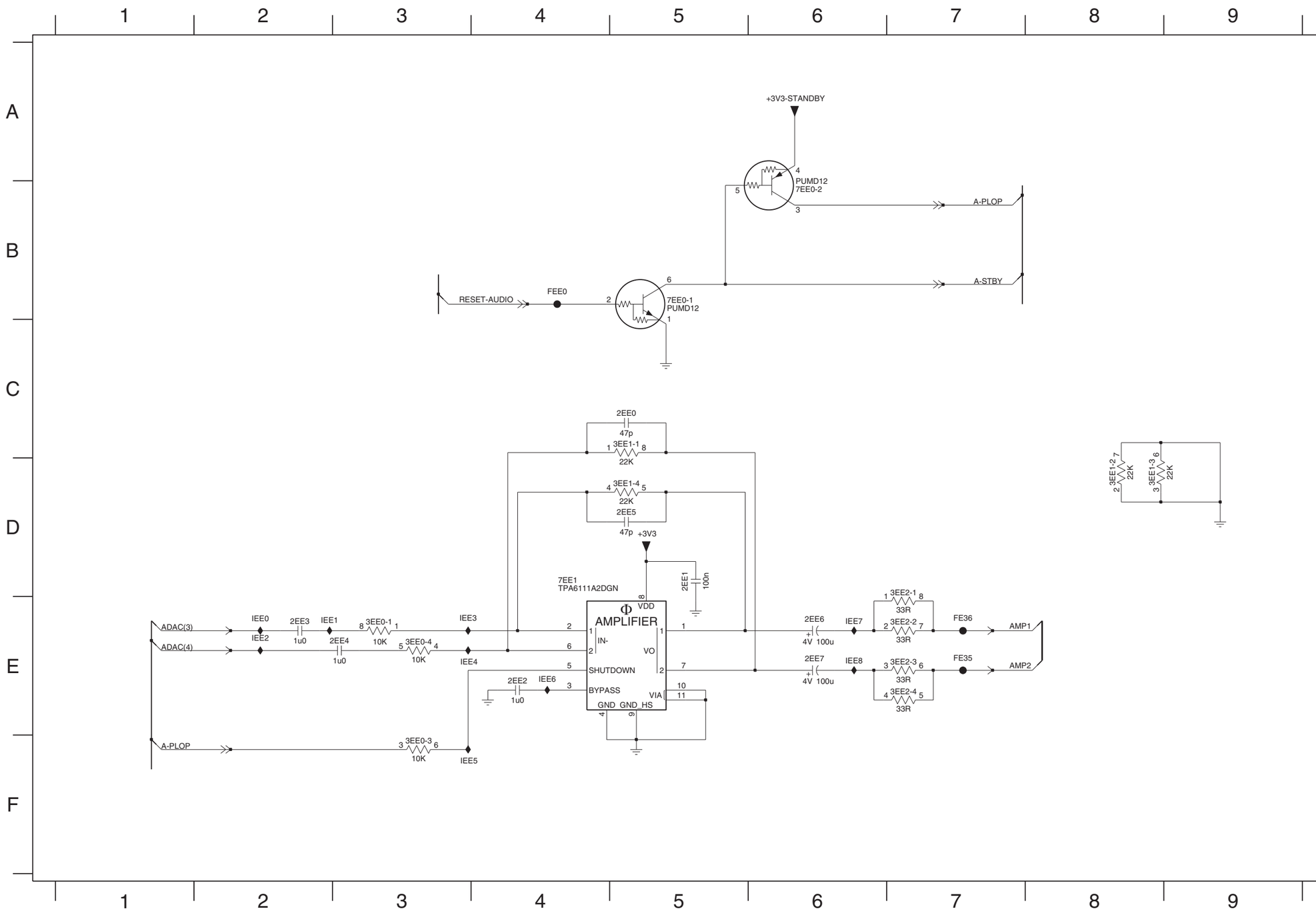
Headphone

B04E Headphone

B04E



2EE0 C5
2EE1 D5
2EE2 E4
2EE3 E2
2EE4 E3
2EE5 D5
2EE6 E6
2EE7 E6
3EE0-1 E3
3EE0-3 F3
3EE0-4 E3
3EE1-1 C5
3EE1-2 D8
3EE1-3 D8
3EE1-4 D5
3EE2-1 D7
3EE2-2 E7
3EE2-3 E7
3EE2-4 E7
7EE0-1 B5
7EE0-2 B6
7EE1 D4
FE35 E7
FE36 E7
FEE0 B4
IEE0 E2
IEE1 E2
IEE2 E2
IEE3 E3
IEE4 E3
IEE5 F3
IEE6 E4
IEE7 E6
IEE8 E6

AUDIO	8204 000 8952	4 2009-10-22

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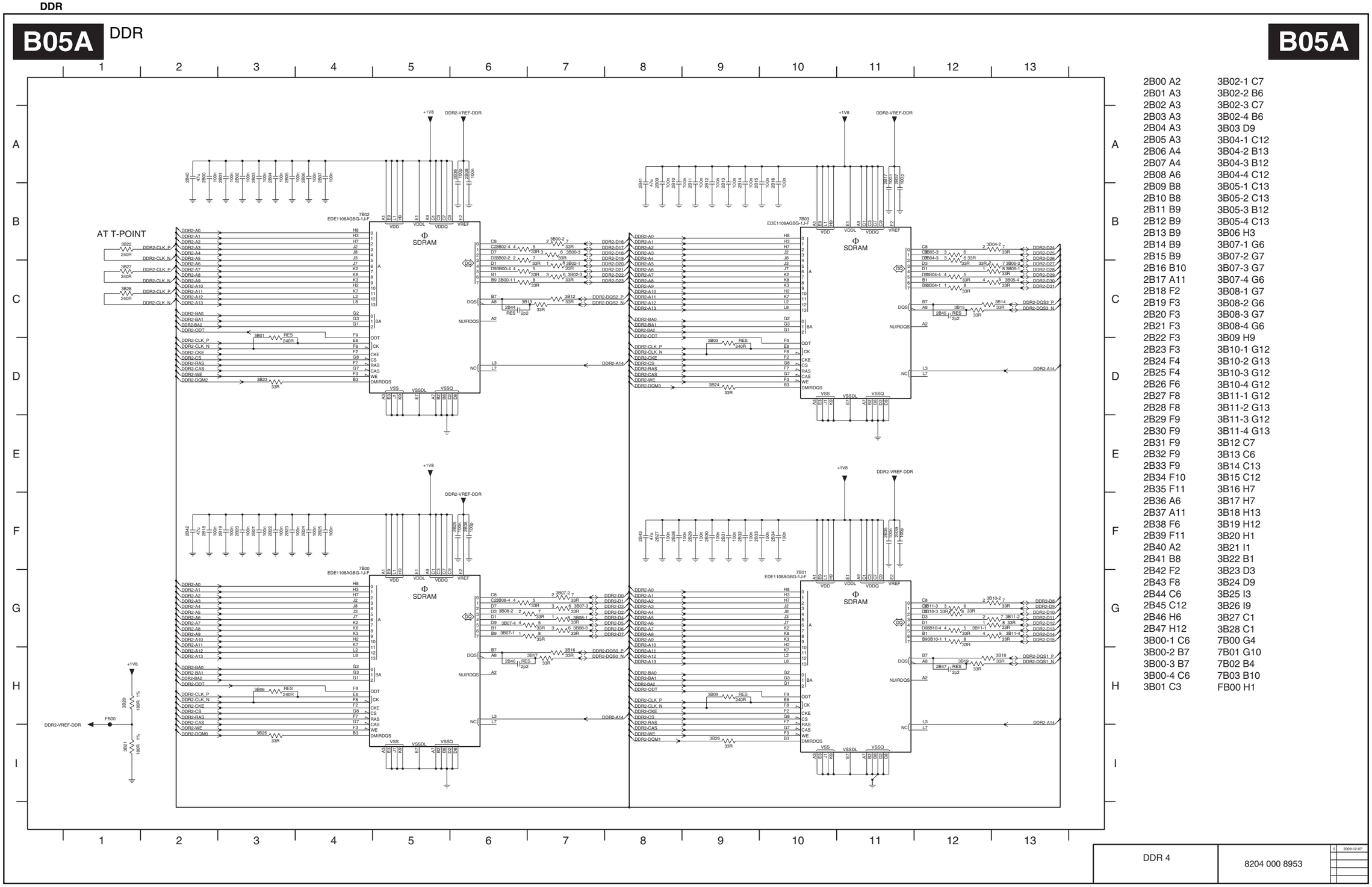
10-13 B05 820400089535 DDR

DDR

B05A DDR



B05A

2B00 A2	3B02-1 C7
2B01 A3	3B02-2 B6
2B02 A3	3B02-3 C7
2B03 A3	3B02-4 B6
2B04 A3	3B03 D9
2B05 A3	3B04-1 C12
2B06 A4	3B04-2 B13
2B07 A4	3B04-3 B12
2B08 A6	3B04-4 C12
2B09 B8	3B05-1 C13
2B10 B8	3B05-2 C13
2B11 B9	3B05-3 B12
2B12 B9	3B05-4 C13
2B13 B9	3B06 H3
2B14 B9	3B07-1 G6
2B15 B9	3B07-2 G7
2B16 B10	3B07-3 G7
2B17 A11	3B07-4 G6
2B18 F2	3B08-1 G7
2B19 F3	3B08-2 G6
2B20 F3	3B08-3 G7
2B21 F3	3B08-4 G6
2B22 F3	3B09 H9
2B23 F3	3B10-1 G12
2B24 F4	3B10-2 G13
2B25 F4	3B10-3 G12
2B26 F6	3B10-4 G12
2B27 F8	3B11-1 G12
2B28 F8	3B11-2 G13
2B29 F9	3B11-3 G12
2B30 F9	3B11-4 G13
2B31 F9	3B12 C7
2B32 F9	3B13 C6
2B33 F9	3B14 C13
2B34 F10	3B15 C12
2B35 F11	3B16 H7
2B36 A6	3B17 H7
2B37 A11	3B18 H13
2B38 F6	3B19 H12
2B39 F11	3B20 H1
2B40 A2	3B21 I1
2B41 B8	3B22 B1
2B42 F2	3B23 D3
2B43 F8	3B24 D9
2B44 C6	3B25 I3
2B45 C12	3B26 I9
2B46 H6	3B27 C1
2B47 H12	3B28 C1
3B00-1 C6	7B00 G4
3B00-2 B7	7B01 G10
3B00-3 B7	7B02 B4
3B00-4 C6	7B03 B10
3B01 C3	FB00 H1

DDR 4	8204 000 8953	5 2009-12-07

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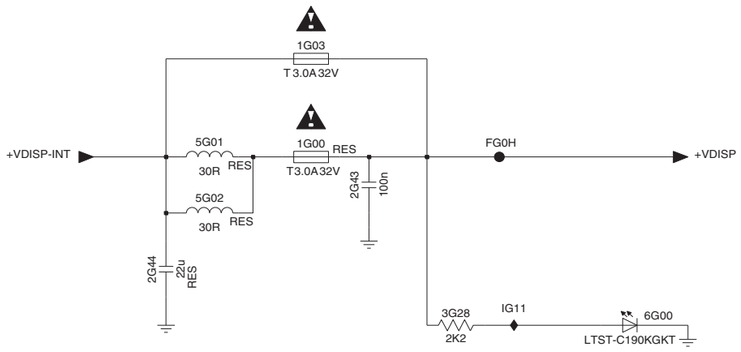
10-14 B06 820400089572 LVDS Non DVBS

Display Interfacing - VDisp

B06A Display Interfacing - VDisp

B06A



1G00 C4
1G03 B4
2G43 C4
2G44 C3
3G28 C5
5G01 C3
5G02 C3
6G00 C6
FG0H C5
IG11 C5

LVDS Non DVBS	8204 000 8957

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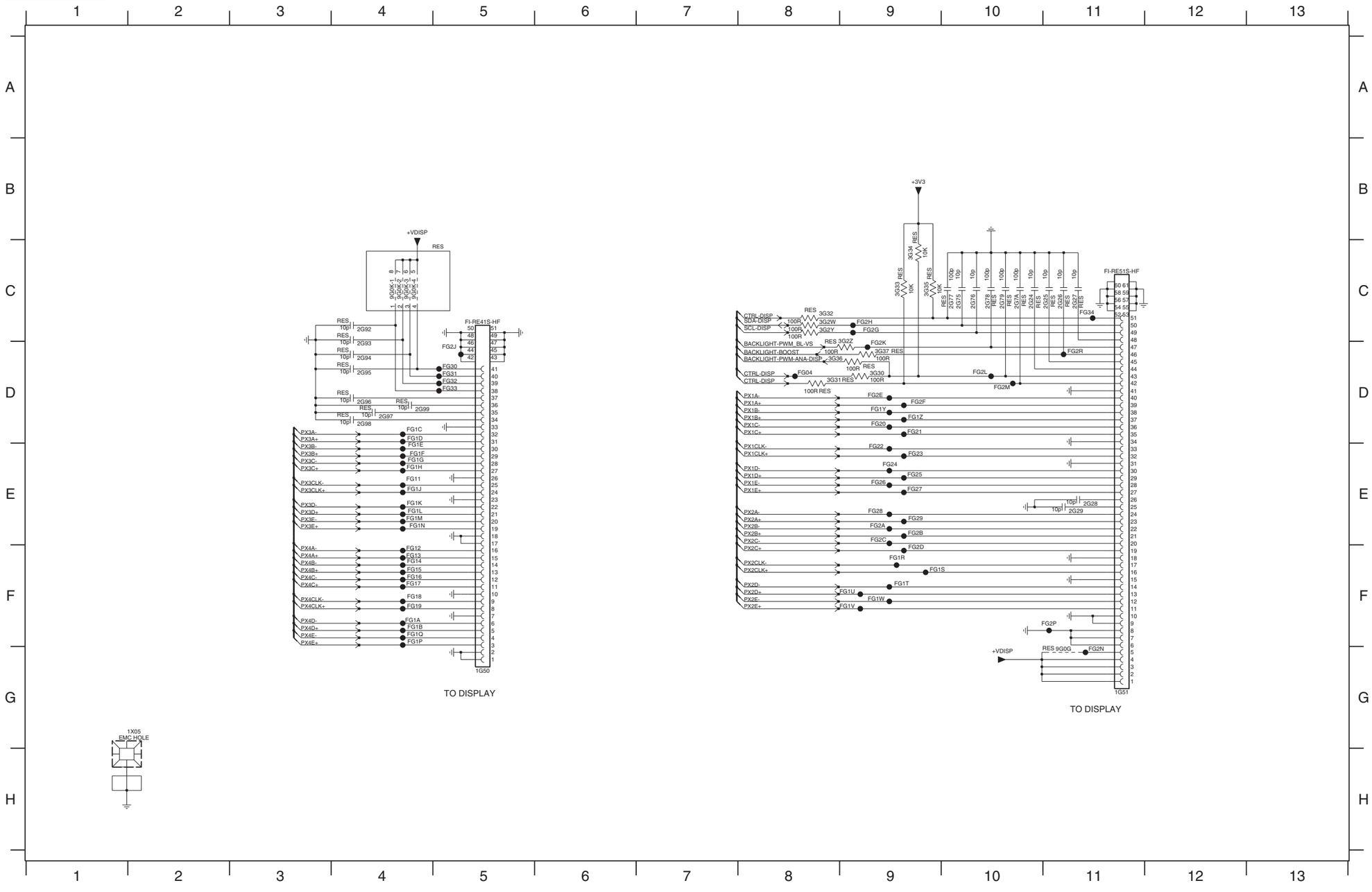
Video Out - LVDS

B06B Video Out - LVDS



1G50 G5	FG1C D4
1G51 G11	FG1D D4
1X05 G1	FG1E E4
2G24 C10	FG1F E4
2G25 C11	FG1G E4
2G26 C11	FG1H E4
2G27 C11	FG1J E4
2G28 E11	FG1K E4
2G29 E11	FG1L E4
2G75 C10	FG1M E4
2G76 C10	FG1N E4
2G77 C10	FG1P F4
2G78 C10	FG1Q F4
2G79 C10	FG1R F9
2G7A C10	FG1S F9
2G92 C4	FG1T F9
2G93 C4	FG1U F9
2G94 D4	FG1V F9
2G95 D4	FG1W F9
2G96 D4	FG1Y D9
2G97 D4	FG1Z D9
2G98 D4	FG20 D9
2G99 D4	FG21 D9
3G2W C8	FG22 E9
3G2Y C8	FG23 E9
3G2Z D8	FG24 E9
3G30 D9	FG25 E9
3G31 D8	FG26 E9
3G32 C8	FG27 E9
3G33 C9	FG28 E9
3G34 B9	FG29 E9
3G35 C9	FG2A E9
3G36 D8	FG2B E9
3G37 D9	FG2C E9
9G0G G11	FG2D F9
9G0K-1 C4	FG2E D9
9G0K-2 C4	FG2F D9
9G0K-3 C4	FG2G C9
9G0K-4 C4	FG2H C9
FG04 D8	FG2J D5
FG11 E4	FG2K D9
FG12 F4	FG2L D10
FG13 F4	FG2M D10
FG14 F4	FG2N G11
FG15 F4	FG2P F11
FG16 F4	FG2R D11
FG17 F4	FG30 D5
FG18 F4	FG31 D5
FG19 F4	FG32 D5
FG1A F4	FG33 D5
FG1B F4	FG34 C11

LVDS Non DVBS	8204 000 8957	2 2009-10-22

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AmbiLight CPLD

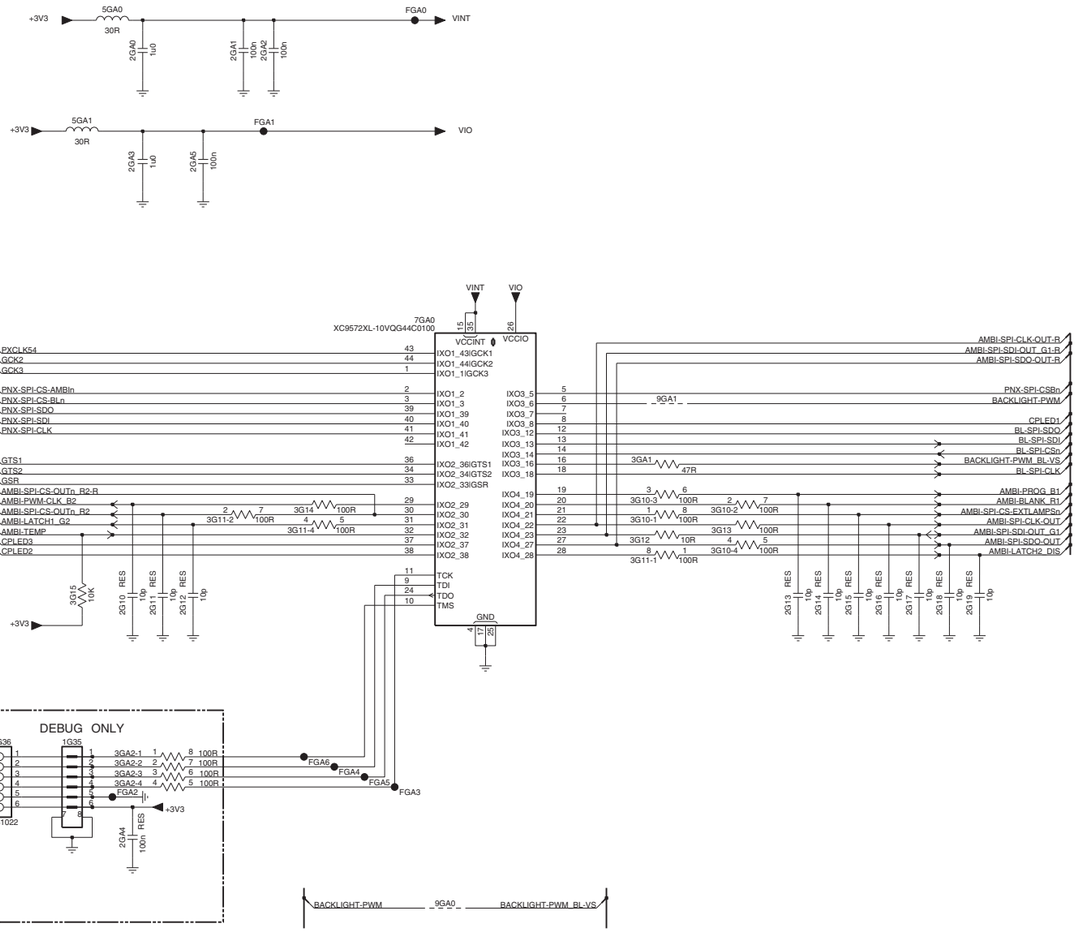
B06C AmbiLight CPLD

B06C

1G35 G2 1G36 G2 1G37 B13 | 2G10 F3 2G11 F3 2G12 F3 | 2G13 F7 2G14 F8 2G15 F8 | 2G16 F8 2G17 F8 2G18 F9 | 2G19 F9 2GA0 B3 2GA1 B4 | 2GA2 B4 2GA3 B3 2GA4 G3 | 2GA5 B3 3G10-1 E6 3G10-2 E7 | 3G10-3 E6 3G10-4 E7 3G11-1 E6 | 3G11-2 E3 3G11-4 E4 3G12 E6 | 3G13 E7 3G14 E4 3G15 E2 | 3GA1 E6 3GA2-1 G3 3GA2-2 G3 | 3GA2-3 G3 3GA2-4 G3 3GA5-1 B12 | 3GA5-2 B12 3GA5-3 B12 3GA5-4 B12 | 3GA6-1 F13 3GA6-2 F13 3GA6-3 F12 | 3GA6-4 F12 5GA0 A3 5GA1 B2 | 6GA0 F12 6GA1 F12 6GA2 F13 | 6GA3 F13 7GA0 D5 7GA1-1 D13 | 7GA1-2 D13 7GA2-1 E12 7GA2-2 E12 | 9GA0 H5 9GA1 D7 FGA0 A5 | FGA1 B4 FGA2 G3 FGA3 G5 | FGA4 G4 FGA5 G5 FGA6 G4 | IGA0 C11 IGA1 C11 IGA2 C11 | IGA3 C11

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

A B C D E F G H



LVDS Non DVBS	8204 000 8957	2 2009-10-22

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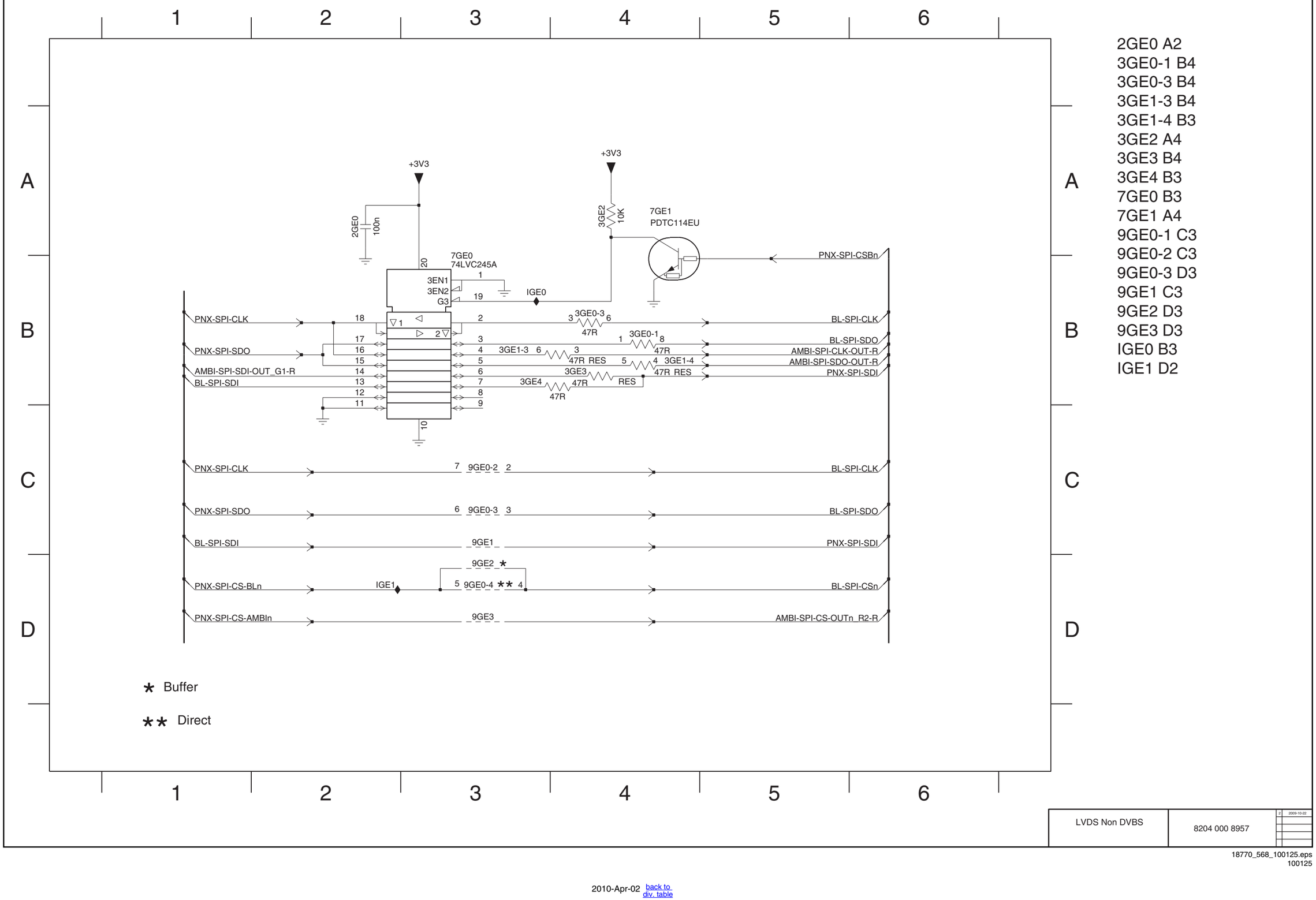
SPI-Buffer

B06D SPI-Buffer

B06D



2GE0 A2
3GE0-1 B4
3GE0-3 B4
3GE1-3 B4
3GE1-4 B3
3GE2 A4
3GE3 B4
3GE4 B3
7GE0 B3
7GE1 A4
9GE0-1 C3
9GE0-2 C3
9GE0-3 D3
9GE1 C3
9GE2 D3
9GE3 D3
IGE0 B3
IGE1 D2

LVDS Non DVBS	8204 000 8957	2 2009-10-22

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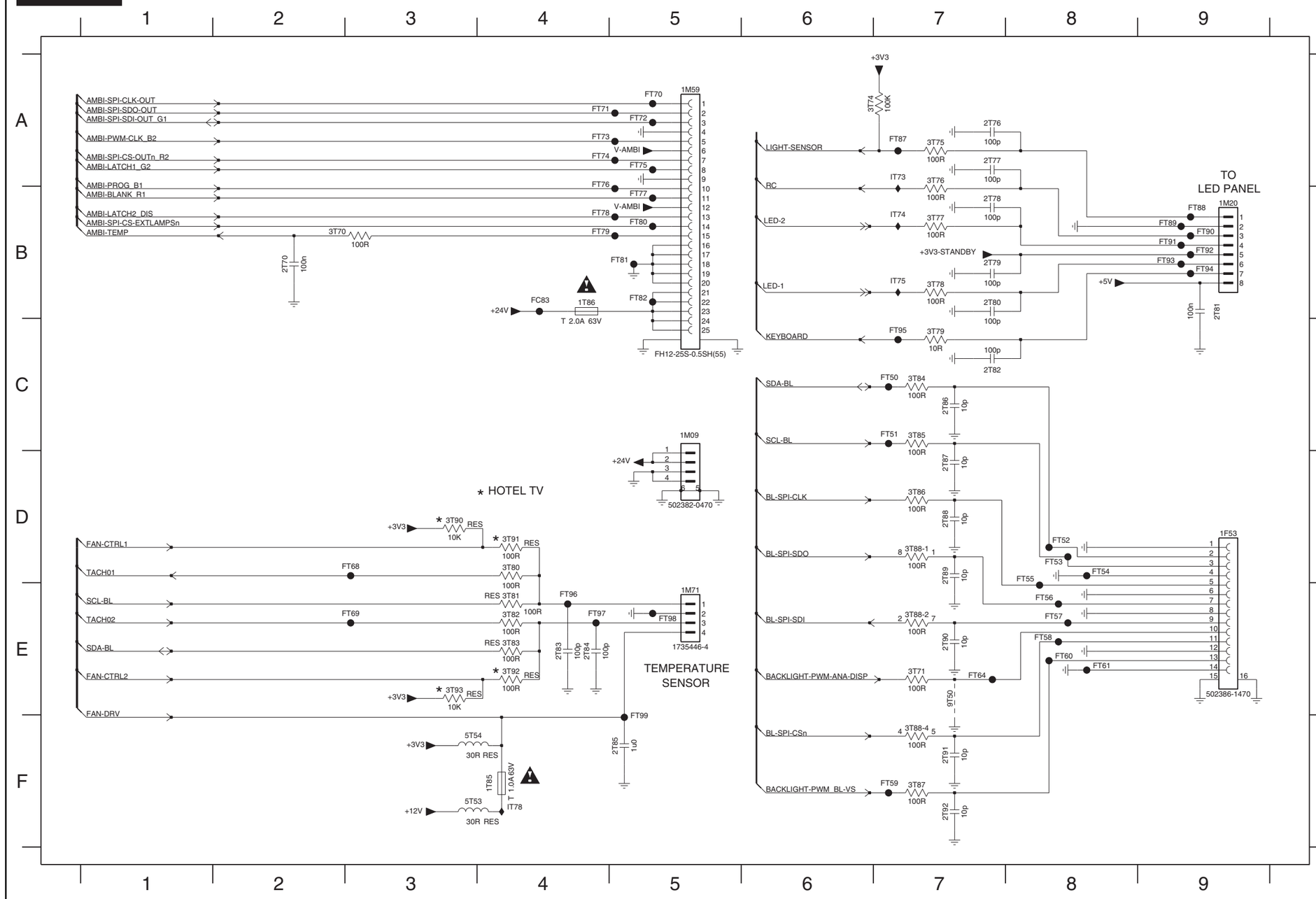
10-15 B09 820400089812 Non DVBS Con.

Non DVBS Connector Board

B09A Non DVBS Connector Board



1F53 D9	5T54 F3
1M09 C5	9T50 E7
1M20 B9	FC83 B4
1M59 A5	FT50 C7
1M71 E5	FT51 C7
1T85 F4	FT52 D8
1T86 B4	FT53 D8
2T70 B3	FT54 D8
2T76 A7	FT55 D8
2T77 A7	FT56 E8
2T78 B7	FT57 E8
2T79 B7	FT58 E8
2T80 B7	FT59 F7
2T81 B9	FT60 E8
2T82 C7	FT61 E8
2T83 E4	FT64 E7
2T84 E4	FT68 D3
2T85 F5	FT69 E3
2T86 C7	FT70 A5
2T87 D7	FT71 A4
2T88 D7	FT72 A5
2T89 D7	FT73 A4
2T90 E7	FT74 A4
2T91 F7	FT75 A5
2T92 F7	FT76 B4
3T70 B2	FT77 B5
3T71 E7	FT78 B4
3T74 A6	FT79 B4
3T75 A7	FT80 B5
3T76 A7	FT81 B5
3T77 B7	FT82 B5
3T78 B7	FT87 A7
3T79 C7	FT88 B9
3T80 D4	FT89 B9
3T81 E4	FT90 B9
3T82 E4	FT91 B9
3T83 E4	FT92 B9
3T84 C7	FT93 B9
3T85 C7	FT94 B9
3T86 D7	FT95 C7
3T87 F7	FT96 E4
3T88-1 D7	FT97 E4
3T88-2 E7	FT98 E5
3T88-4 F7	FT99 F5
3T90 D3	IT73 A7
3T91 D4	IT74 B7
3T92 E4	IT75 B7
3T93 E3	IT78 F4
5T53 F3	

Non DVBS CONNECTOR BOARD	8204 000 8981	2 2009-10-22

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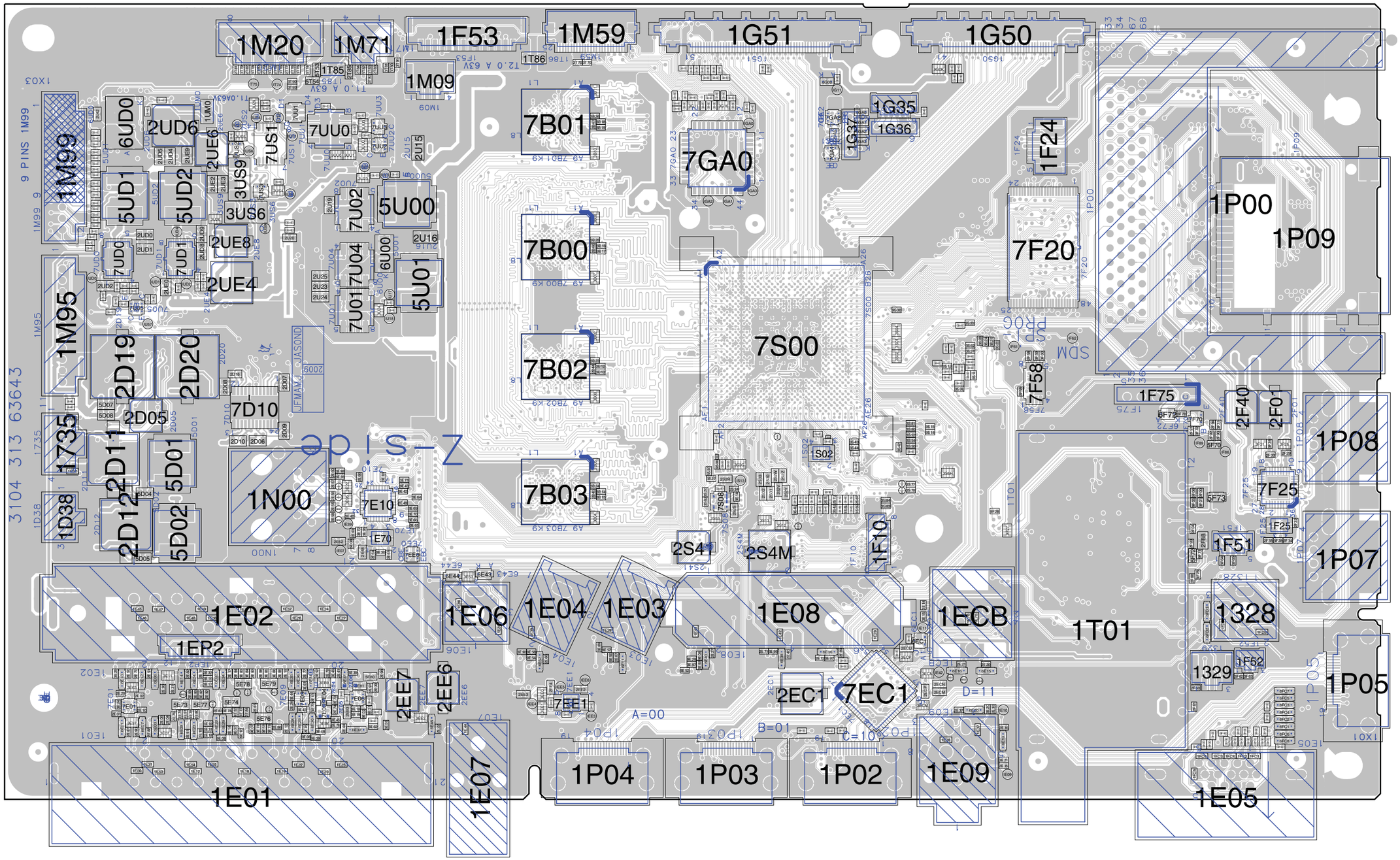
10-16 310431363643 SSB Layout

Overview top side



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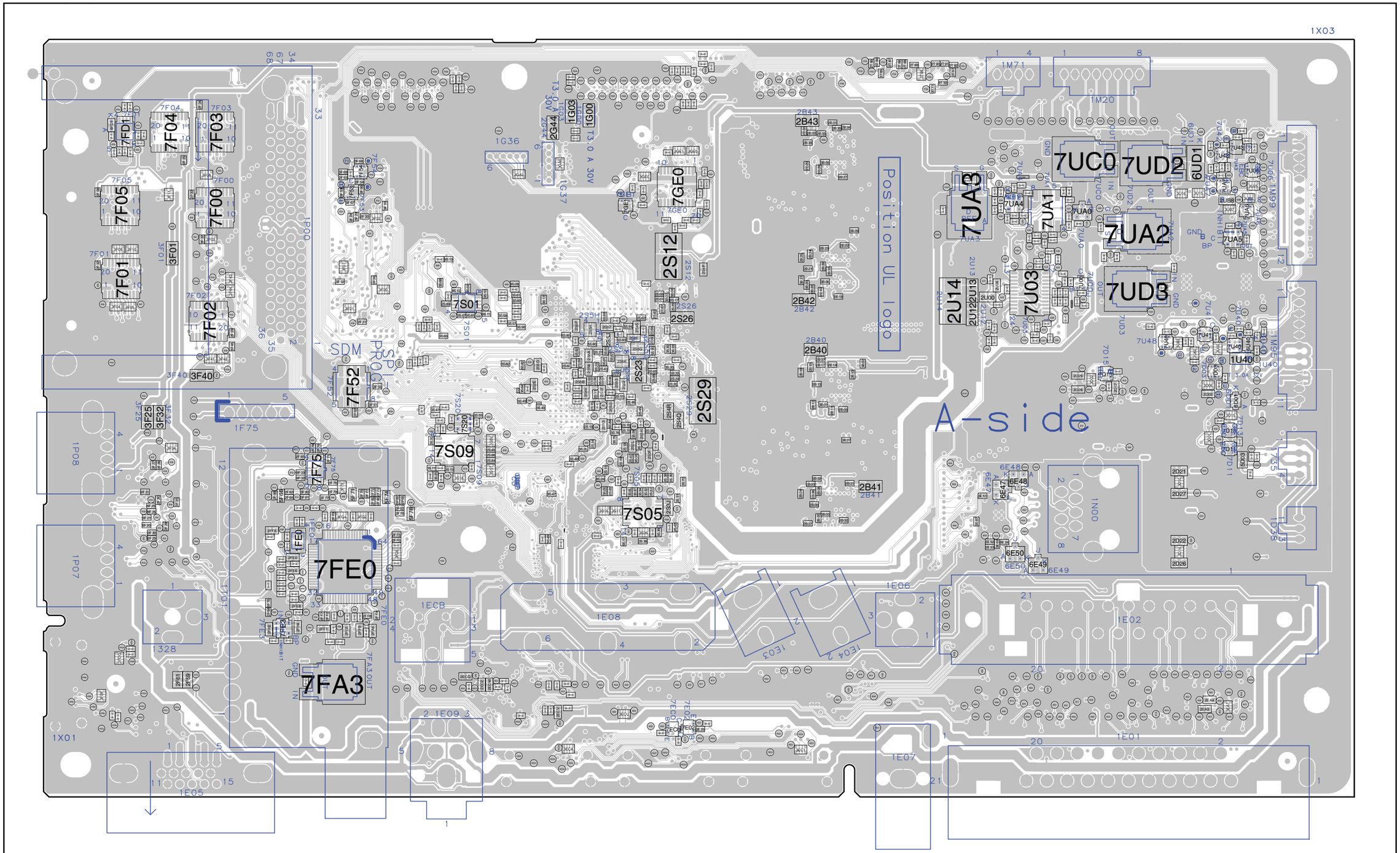
Overview bottom side



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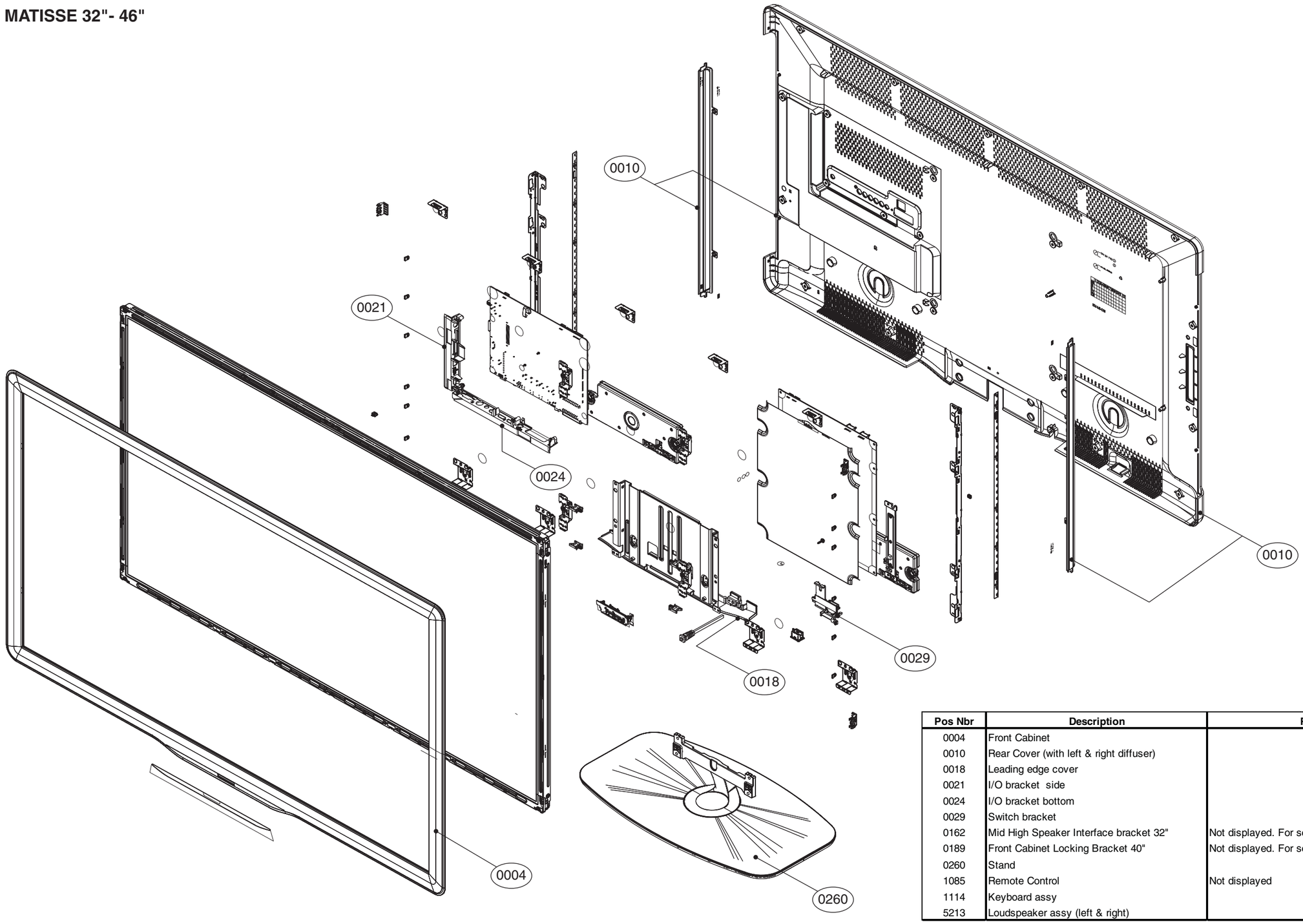
11. Styling Sheets

11-1 Matisse 32" - 46"

MATISSE 32"- 46"



Pos Nbr	Description	Remarks
0004	Front Cabinet	
0010	Rear Cover (with left & right diffuser)	
0018	Leading edge cover	
0021	I/O bracket side	
0024	I/O bracket bottom	
0029	Switch bracket	
0162	Mid High Speaker Interface bracket 32"	Not displayed. For screen size 32" only
0189	Front Cabinet Locking Bracket 40"	Not displayed. For screen size 40" only
0260	Stand	
1085	Remote Control	Not displayed
1114	Keyboard assy	
5213	Loudspeaker assy (left & right)	

FOR ELECTRICAL PARTS SEE WIRING DIAGRAM CHAPTER 9

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